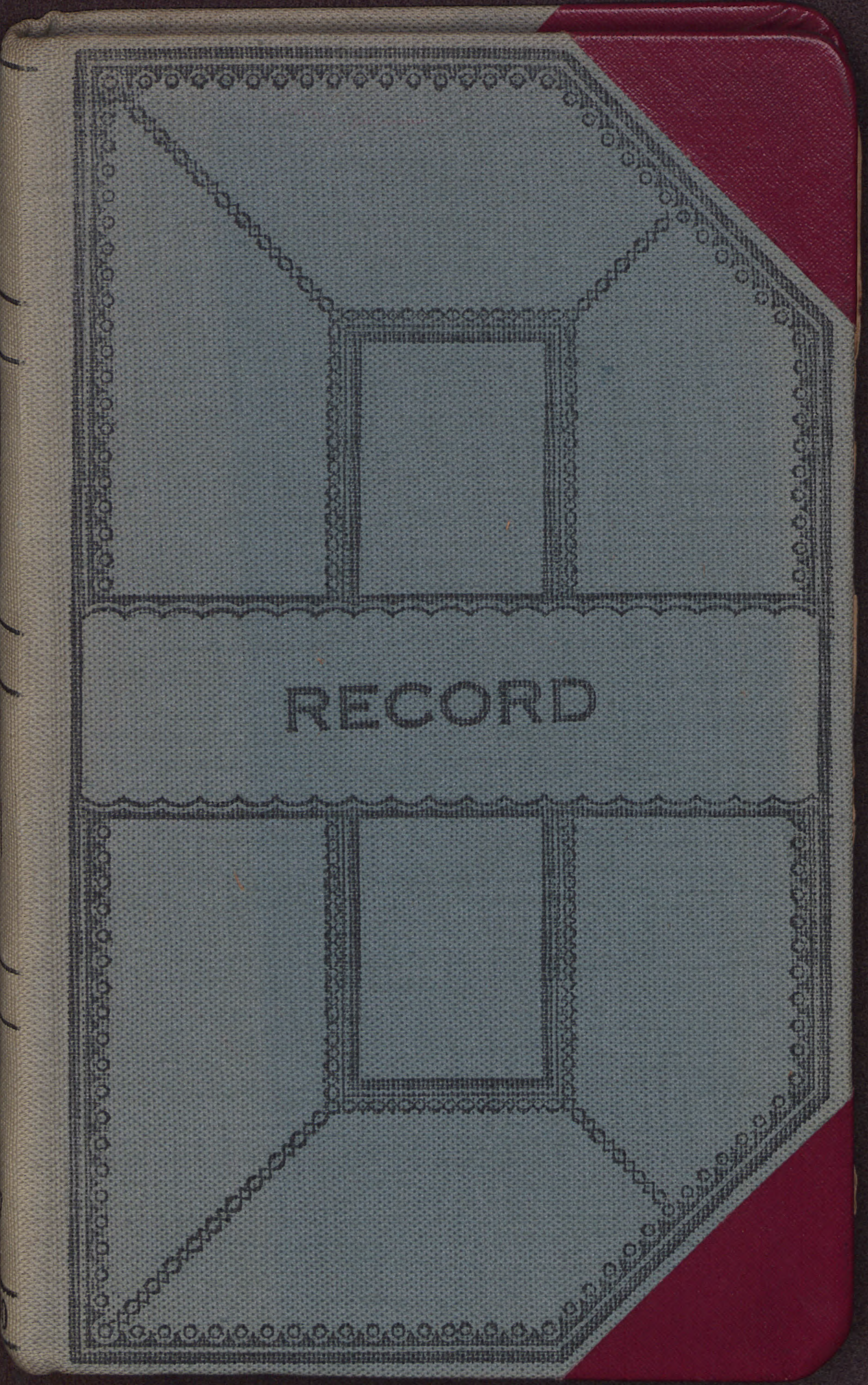

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Collection and Field Note Book

No. 61

(March 24, 1961 - June 25, 1961)

(41723 --- 41861)

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Mar. 25 - Kipuka Puaulu

0.1 mi. on Truck Road on right in grassy opening -

8 Hibiscadelphus trees of varying sizes up to 4 m. tall planted in a group. Several of them seem to be rather chlorotic and dying back from tips - these in sun. ~~those~~ four in shade look better, but of these, the 2 largest seems to be affected by a mosaic similar to that on Gossypium tomentosum. One flowering + fruiting.

1 small "aiea"
1 small Pisonia.
1 small Alphitonia
4 ~~he~~ healthy Pittosporum hosmeri
1 Hibiscus brackenridgei (1.3 m) leafless.
2 "Papala"   1 small Kokia.

Clearing surrounded by large Sapindus, one or two large lehua, a number of ~~several~~ Myrsine sp. clumps of Pipturus, one or two small Psychotria, 2 Pelea sp., several Coprosma

Thicket of koa saplings by road.

Weeds: Pasp. dilatatum, Cyperus brevifolius, Mentha spicata, Holcus, Verbena bonariensis, Cynodon dactylon Commelina diffusa, 1 Sonchus sp. (arvensis?), Ranunculus sp. Pteridium   Rubus penetrans around edges.

Geranium carolin.

1961 Hawaiian Is.

March 24 - Captain Cook,
South Kona

41723 Hibiscus brackenridgei v. kauaiana Caum
X 1 cultivated in garden of Amy Greenwell

Mar. 24 - Kealikakua, South Kona
2 24 Sambucus mexicana v. bipinnatifida
planted generally around houses, no tendency to escape noted.

Mar. 24 - Kaupulehu Forest Reserve,
North Kona
in open dry forest on aa lava slope
3 25 Cocculus
locally common in openings
4 26 Cyperus hillebrandii Boeckl.
common
4 27 Colubrina oppositifolia
occasional
2 28 Canavalia galeata var.
occasional in open
3 29 Nothocestrum breviflorum Gray
occasional Fer 128
4 30 Diospyros ~~sandwicensis~~ ferrea var. pubescens Fosb.
dominant tree
1 31 Asplenium adiantum-nigrum L.
rare, in rock crevices

Hawaii

400 m.
[illegible]
depressed spreading plant; flowers butter yellow with maroon center.

450 m.
shrub 3-4 m. tall; flowers white. lvs. tending to be folded, a few with lower pinnae trifoliate.

640 m.

twines, flowers with calyx whitish, petals yellow, narrowly triangular with blunt apex.

culms solitary, ascending.

tree 8 m. tall; fruit immature.

twining vine; flowers maroon, standard with white spot and lines at base. (fruit from different plant, nearby).

tree 6 m. tall.

small tree 5 m. tall, spreading, much branched; corolla light maroon; fruit immature

1961 Hawaiian Is.

41732 Asplenium trichomanes
1 rare, in rock crevices
4 33 Osteomeles anthyllidifolia (Sm.) Lindl.
occasional
3 34 Sicyos
rare in opening
3 35 Korthalsella cylindrica
abundant locally on
Diospyros ferrea ~~[illegible]~~
4 36 Pouteria
rare
4 37 Cocculus
local

1 38 Kokia ~~drynarioides~~ rockii Lewt.
rare

1 39 Peperomia leptostachya
common in rock crevices
2 40 Argemone ~~alb~~ glauca var. inermis of Deg.
rare in opening
4 41 Sida fallax
very common in openings

3 42 Chenopodium oahuense
very common, especially in opening
3 43 Nototrichium sandwicense
very common
3 44 Lipochaeta
rare in opening
3 45 Xylosma ~~hawaiiensis~~ hillebrandii Wawra
rare

Hawaii

tree 3 m. tall; fruit immature.

vine creeping over ground;
flowers whitish.
joints cylindric; branches
decussate; flowers all around
nodes.
Tree 8 m. tall; buds and
young growth rusty brown.
twiner; ~~flowers~~ calyx whitish;
petals yellow at base,
white distally, narrowly
triangular, emarginate at apex.
slender tree 5 m. tall;
involucral bracts patent,
stiff, purple above, green
with reddish veins beneath.
stem and leaves fleshy

odor of fls. like stale perspiration
erect, very glaucous, 1.7 m.
tall, sap yellow; petals white.
~~herb~~ slender shrub 1.3 m. tall,
branched; calyx maroon;
corolla orange with red
centers.
erect shrub, 2 m tall,
somewhat disagreeable odor
small tree, 3 m. tall,
grayish.

sterile small tree with
drooping branchlets.

1961 Hawaiian Is.

41746 Senecio mikanioides Otto
4 occasional in openings

March 24 - 15 mi. n.w. of Kailua, 600 m.
on road to Waimea

in dry open forest on aa lava
4 47 Canthium odoratum
common
3 48 Diospyros ferrea var. pubescens Fosb.
abundant

Mar. 24 - Puu Huluhulu, 2100 m.
Humuula Saddle
1 49 Bromus rigidus
locally abundant ~~in~~ on grassy slope
1 50 Poa pratensis
locally common on grassy slope.
2 51 Rubus macraei ?
locally abundant in koa forest

3 ea. {52 Coprosma montana var. montana Hbd. ♀
{53 Coprosma montana var. montana fruit
{54 Coprosma " " ♂
base of cinder cone at edge of lava flow
Mar. 25 - Kipuka Puaulu, Hawaii National Park
open areas with scattered trees 1225 m.
3 55 ~~Ranunculus~~ Hydrocotyle sibthorpioides var. oedipus Deg.
locally abundant in grass in
1 56 Pipturus
local around margin
1 57 Pipturus albidus (H. & A.) Gray
under trees

Twiner; flowers yellow.

small tree 4 m. tall;
leaves glossy; fruit immature.
small tree 5 m. tall;
fruit immature.

forming dense masses
1.5 m. tall; petals rose purple.

shrub 1.5 - 2.5 m. tall.

shrub 2-3 m. tall.

shrub 2 m. tall.

Mar. 25. Kipuka Puaulu
Regular trail.
Goes in through tall lehua forest, rather open. Around edges Dodonaea and Styphelia bushes and grass.
From top of first small rise mixed mesophytic forest with lehua, Sapindus, Sophora Psychotria, Osmanthus, Coprosma, Myrsine, Pipturus

one small planted Kokia on either side
Main canopy layer here is mostly lehua with some Sapindus
under story Coprosma, Psychotria, Osmanthus
~~Pisonia,~~

Fragaria on ground.
patches of Microlepia
Geranium, Commelina (in open)

Soon Sapindus becomes dominant in canopy.
Understory more or less same. but with Pisonia.

Then open park-like area, with Sapindus not nearly so tall, one or two tall lehuas, one Persea. + clump of Cibotium. 1 Sophora. abundant bracken, with grass (Anthoxanthum, Holcus, Paspalum dil.)

Coprosma + Psychotria + Pipturus saplings strictly under Sapindus + lehua.
Some masses of Microlepia and Pipturus.
Gouldia tree on rt. marked by stake 17, type tree of one of my new forms.
One Pelea, several Sophora Myrsine, all rather small.

Entering another small parkland, then Sapindus strip. a thicket of large Sophora on left. good isolated koas.
Just above trail here is a Sapindus with a good mass of epiphytic Peperomia reflexa on side away from trail.

Photos - 2 of lehua forest at entrance, both dense and sparse (away from park), several in parkland, incl. Gouldia tree, one of koa. general view, then 2 more of koas.
finish roll on open lehua - koa
next roll, Tri X - shots in forest of lehua trunks, views, Cibotium Microlepia. Views above & below trail in lehua for.

Then mixed lehua - sapindus with Charpentiera, Coprosma, Psychotria Sophora in understory.

ground largely bare except masses of Nephrolepis and Microlepia and a large mass of Peperomia - 2 forms of P. reflexa, large on ground, small on tree trunk, side by side. (stake 24)

Then into open park like lehua with some koa, some ~~C~~ Coprosma and Sophora, Pipturus. Grass and Nephrolepis exaltata (golden pubescence on rachis but blunt lvs.)

Pteridium is generally abundant, with Cynodon, Anthoxanthum, Pasp-dil. Veronica plebeja.

Rather dense lehua forest with understory of Coprosma, Psychotria, Pipturus, Osmanthus, Pelea

Strawberries and Poa on ground. Locally Microlepia & Pteridium. Much bare ground. ~~Hymen~~ Hypolepis?
On side trail giant koa 4 times my arm spread around. perhaps 25 m. tall.

Above trail - lehua forest with little undergrowth, below with much, esp. Coprosma.

Photo - large lehua trunk with enormous Fomes. views in lehua forest. end roll on Peperomia reflexa ground cover.
More open part, with Pisonia, Straussia, Coprosma & Pipturus in understory. Myrsine. Osmanthus, Sophora.

Then on rt. generally dense Sapindus + lehua / with thick understory, on left more open, lehua then koa savanna.

Then on rt. Sapindus lehua parkland. some Psychotria etc. under bigger trees. Trail goes into this and it gets closer – typically open forest.

Hibiscadelphus planted on right, flowering and fruiting well. 3 m. tall. Smaller one above it, more glabrous, marked Hibiscus giffardianus. Hibiscus brackenridgei planted 30 m. below it.

Then, mixed mes.-forest on rt, koa-lehua savanna on left.

Mar. 25 – path to crater rim across from KMC.

Scrub of Styphelia, Vaccinium stunted lehuas, Dodonaea

Polypodium pellucidum on left in low lehua bushes. rt. also. Several Sadleria. becoming commoner toward the crater rim.

Mar. 26 – same.

On open spaces of bare ground Conyza canadensis var. pusilla and Bulbostylis capillaris are very common. The latter is found anywhere where there is loose ash of a sandy texture.

Coming to the rim, an awesome view of a solidified lake of swirling lava presents itself, with the gaping pit of Halemaumau in the middle distance. Tiny tufts of vegetation are scattered over this lava, and plumes of steam rise here and there. Sections of the cliff rim are separated by great cracks and seem about ready to fall into the crater.

(to page 17)

Mar. 26 Flat in front of Wentworth House, Haw. Nat. Park

Scattered lehua up to about 8 m. tall. spaced 2-6 m., trunks up to 8-10 cm. dbh.

Ground generally covered by Gleichenia.

A few Ilex and Santalum scattered in this, much smaller than the lehua.

Astelia common. Machaerina fairly common. Lycopodium cernuum common. Smilax occasional. Dubautia scabra and Dubautia occasional.

Vaccinium reticulatum very common. / up to 4 dm. tall; Styphelia tam. common, up to 2.2 m. usually to 0.5.

Sadleria cyath. common.

one small colony of Rubus seen.

Coprosma ernodioides local in thin places in the Gleichenia.

Sacciolepis occasional.

another grass rare. (coll.)

~~Rhynchospora~~ rare.

Gahnia gahniaeformis rare

Hypochaeris radicata rare

Fragaria rare.

Vaccinium pahalae ? ~~[illegible]~~ l.c.

Vacc. calycinum rare

Polypod. pellucidum occ.

Dianella common

Uncinia occ.

Setaria sp. r., Holcus r.

The above description applies to a strip about 100 m. from the cliff base. It is cut by many cracks.

Out from this the lehuas are larger, more widely spaced. Between them is a rather open scrub, irregular, 0.3-1, rarely 2 m. (the shrubs over 1 m are young lehua), of Styphelia, Vaccinium ret. Dodonaea, lehua.

In addition there are,

r. Sadleria
c Pteridium
c Lyc. cern.
o Setaria
c Hypochaeris rad.
c la Fragaria
c Hypericum jap.
c Deschampsia
c Sporobolus (with smut)
~~o~~ r Phajus grandiflorus
~~o~~ c Polypod. pell.
o Rubus penetrans
c Coprosma ernod.

Cladonia is common on ground. 1 Andropogon clump seen.
Farther out the lehua is closer together again

A straight swath has been cut through this to below the Cummins house from

The effect of this road may be foreseen by observing the land along the present dirt road running in from the front corner of KMC. and crossing this
Grasses have spread in for about 10 m on either side. Other weeds also.

Mar 26 Crater Rim Trail from front of KMC. turn left –
The vegetation here is the same loose scrub of Styphelia, Vaccinium, Dodonaea, Sadleria, and Polypodium, with scattered small Metrosideros. In the cracks Sadleria is abundant. The plant with linear hard grass like leaves is Machaerina angustifolia. Tangled Gleichenia linearis var. tomentosa is common a bit away from the rim. The large yellow flowers are Oenothera stricta. the smaller ones Hypochaeris radicata. Dubautia is the small shrub with conspicuously 6 ranked short lance-oblong leaves. It has small yellow heads in clusters when in bloom. Cyperus is an occasional weed along the trail, as ~~is~~ are Andropogon virginicus, Sporobolus elongatus and Sacciolepis contracta.
A native tussock-forming

grass, not so common, is Deschampsia

The abundant soft red berries are Vaccinium reticulatum (ohelo) and are quite edible.

The trail follows the rim a few feet from it. Some variation may be noted in the lehuas - a bright green bush is on the right a short distance down the trail; but most of the trees are the common var. incana, which colonize ash and lava.

As the trail goes down a short defile Sphenomeris chinensis, Nephrolepis exaltata, ~~and~~ Wikstroemia sp. ~~mas~~ and Gahnia gahniaeformis may be seen together on the bank to the left.

On the slightly lower level at the bottom of this the vegetation generally is much sparser and lichens cover much of the ground.

A few yards along from this are distance and direction signs.

Among the weedy grasses along this trail is the common ~~[illegible]~~ European Anthoxanthum odoratum, (sweet vernal grass) familiar in many parts of the world, also Setaria geniculata.

If the Vaccinium fruit is ripe great variation in size, color, and taste will be evident.

Just before the trail comes out onto the steaming flats Gleichenia linearis becomes abundant on the right, with Lycopodium cernuum, the strange little tree-like plant with hanging cones on the tips of its branches and long runners arching between the erect fruiting stems.

~~The mat-like grass in the trail with unpleasant tiny needle-like fruits is Chrysopogon aciculatus.~~

On the steaming flats the vegetation becomes very low and dwarfed. The lehuas, now very widely scattered, are here only about 1 m. tall.

everything else is less than half that. The abundant gray moss that shares the bare spots with the lichens is the widespread

In the first steam crack, on the right dwarfed Sphenomeris and Nephrolepis may be seen lining the edges. (Experiment with smoke)

In the second opening Paspalum orbiculare is common. and Pityrogramma calomelanos.

The right hand branch of the trail follows a great steam crack filled with luxuriant Nephrolepis cf. biserrata. Carpet grass (Axonopus compressus) lines the margin and is abundant out on the flats

The small purple flowered herb in the cracks is Cuphea carthagenensis.

The Hawaiian Luzula (L. campestris var.) is also there.

Clumps of Andropogon and several of Arundina and Spathoglottis are found back of the steaming bluffs. ~~[illegible]~~. The steaming
also Cassia leschenaultiana.

bluff, largely bare of vegetation at the top, is just to the right of the trail. Below it a slope of lava covered by lehua and Gleichenia.)

The trail down to the Caldera floor may be seen opposite around the curve in the cliff.

Then another large steam crack on left.

At ~~an~~ the intersection there is a choice of three trails. ~~Choosing~~ The one to the right, the Sandalwood trail enters a low open lehua forest with an abundant tangled ground layer of Gleichenia. ~~Crossing~~ Across a large crack a good growth of Nephrolepis exaltata (or N. hirsutula) may be seen on the right of the trail.

The next crack is a large one and in it is a giant Thelypteris fern.

In the next one a slender Pteris and Pityrogramma in addition to the common ferns. Spathoglottis plicata in the crack and along the trail.

The under story gradually

changes from Gleichenia to Sadleria cyatheoides. Wikstroemia is occasional, as well as Coprosma (glab.) Before and after the third bridge Eupatorium riparium has gained a foothold.
On the right Dubautia

100 m or so beyond this bridge the sandalwood trees for which the trail is named may be seen. Their broad leaves and yellow green color identifies them (S. pan.). Just before them Smilax sandw. twines over a tree to the rt. Coprosma ernodeoides forms masses gro Elaphoglossum hirtum a small tuft on a tree. Astelia menziesii on ground beneath the Smilax.

If the Santalum is in flower its delicious odor may be noted.

Beyond the Santalum, on the left ~~is~~ the small bamboo-like grass is Isachne distichophylla, representative of an important Pacific genus. The silvery leaves of Astelia are just beyond. By the

next bridge, with Wikstroemia.

This forest is a fairly well developed lehua forest and represents a stage toward the giant forests to be seen on older lavas. The abundance of Lycopodium, Sadleria, Machaerina and Gleichenia shows that it is still a relatively young forest. It may be noted that as yet there are few ~~[illegible]~~ tree ferns, though some ~~few~~ may be seen farther in the forest to the left.

Paspalum conjugatum and Cyperus compressus along trail.

The great crack on the left shows that the section of the crater rim on which the trail ~~op~~ runs may ~~is~~ be destined, sometime, to fall into the caldera. Lycopodium cernuum is unusually abundant (Degener story).

As the trail descends and starts along a ledge on the cliff Smilax is on cliff to right

In the distance ahead may be seen the bare new cinder cone at Kilauea Iki, formed in 1959.

Andropogon glomeratus on edge of cliff, also Pteridium aquilinum. along trail.

Andropogon virg. occ. ~~on left~~.

Sacciolepis contracta and Sporobolus elongatus (smutty one) along trail. Below

Fragaria along trail.

Trail out on shelf away from cliff on left! then turns down to left to foot of cliff where Halemaumau trail branches off in taller lehua forest with more Cibotium.

Trail climbs scrub covered cliff to left. Santalum on cliff with small lehua and Dodonaea. Weedy grasses along and above trail. Eupatorium riparium. Hypericum japonicum

Spectacular cliffs, ~~and~~ caldera floor, and Byron ledge to rt.

On cliff to left a ginger prob. ~~Hedyotis~~ Zingiber zerumbet (or Hedychium?) Also Lythrum maritimum by steps. Cyperus brevifolius on rt. tall virgate

shrub with stiff pointed leaves below huge rock on rt. is Hedyotis glomerata var. centranthoides.

Fuchsia magellanica ~~on left~~. ~~at~~ slender shrub ~~along~~ overhanging trail. above narrow defile tree ferns, Cibotium cham. (hawn). At end of defile, mnt. Cyrtandra cf. cordifolia.

Under ~~a~~ tall Cibotium abundant ~~[illegible]~~ Hedychium sp. and mat of Selaginella cf. Tritoma. Commelina diffusa.

Climbing trail - Psidium catt. single slender sapling to rt. Mat of Hypericum jap. on ground along side of trail. Lehua forest gets lower. Hedyotis glom. very common in ~~middle~~ upper part of ~~trail~~ slope in ~~open~~ low lehua forest.

On left after trail levels off. Coprosma -(small lf. pub. twigs).

Scattered Cibotium, forest more open. Tangles of Gleichenia. Intersection. Trail to rt. to park Hq. Hedychium abundant. Escaped Rosa Erigeron karwinskyi~~ano~~

Volcano House

Tritoma, Eupatorium, Commelina. abundant. Torch ginger. Heterocentron?

Foot Path Volcano House to KMC.
Through a sparse young koa planting ~~with~~ into weedy grass area:
Erigeron karw., Tritoma, Commelina, Cyperus brevifolius Cynodon dactylon, Rubus penetrans, Rosa (baby rose) Cyperus compressus. Paspalum dilatatum, Cyperus sp. Desmodium uncinatum Bidens pilosa, Sacciolepis contracta, Anthoxanthum odoratum Hypochaeris radicata Cherokee rose. Pennisetum cland. Holcus lanatus,
Tritoma forms great masses by veg. spread.

At end of meadow a clump of ornamental Rhododendron on rt., Tibouchina on left. On rt. a thicket of Morus sp. and Tibouchina, Hedychium. Psidium guajava a slender bamboo.

Enter open lehua wood, with Hedychium and Tibouchina

~~Trail~~ Road in to Sulphur Banks, to rt. through open lehua with Gleichenia, forming deep tangles, with Lyc. cern.

Off road to left a small trail leads to row of steaming vents with sulphur deposited on earth and on plants.
Across from this, at end of road, is a spectacular deposit of sulphur on a steaming bank, practically devoid of vegetation.

In front of this is a flat with very low vegetation - Gleichenia lin., Lyc. cernuum, Pasp. orbiculare Luzula, a few small lehua and Dodonaea, to 1.5 m. tall. Erechtites val. (purple) (rare)
l Arundina ~~[illegible]~~)
a Styphelia
d Vaccinium reticulatum
l Andropogon virg.
o Sphenomeris chinensis
r Spathoglottis
r Gahnia gahniaeformis
c Cyperus sp (comp.?)
lc Dodonaea
Much bare ground in center of basin [illegible] with sparse depressed Fimbristylis dichotoma. Dodonaea, gray moss, Cladonia, Waltheria (r.), Sacciolepis, Conyza can. patches of Nephr. exalt. (dwarfed), Sphenomeris,

along trail Gleichenia
gradually dominates.
Occ. Machaerina ang.
becoming commoner, Lehua
becomes commoner.
Forest to left.
Then Coprosma ernod.
along trail, Hypericum jap.
Sporobolus along.

Thin strip of lehua
forest with abundant
Sadleria.
to open Gleichenia
tangles with scattered
small lehuas.
to Steaming Flats, with
great steam cracks.
Right fork at sign
thru low Gleichenia
Lyc. cern. Gahnia, Vacc
Dodonaea, gray moss mixture.
giving way to low
Gleichenia tangles.
Pluchea odorata in trail.
Nephrolepis cf. hirsutula
locally abundant.
esp. around steam vent.
Trail skirts inner
edge of flat along edge
of forest. thru Gleichenia
tangles.
Small trail to left
onto moss covered flat

with Melinis clumps,
large erratic boulder
(thrown by 1924 eruption?)
back to trail which
continues through
Gleichenia, patches
of open ground with
lichens and moss. low
Vacc. Dod. Styph. weeds.
More Gleichenia.

Cordyline to rt. at foot
of low ~~cliff~~ scarp.

Where trail turns toward
low cliff some Cenchrus
ech. var. hilleb. guava,
Rubus pen. Desmodium
uncinatum, Spathoglottis
Nephr. + Lyc. cern dominants
Rosa seems sterile but
has spread.

Climb scarp onto flat
with open low
lehua and bunch
of lehua Dodonaea,
Styphelia Pteridium,
Sadleria Gleichenia,
Vaccinium ret. Dubautia
Polypod. pell. weeds
In grassy opening and lehua savanna
Oenothera, Gahnia
scattered, Santalum.
Come out at KMC.

Mar. 26 - Crater Rim Dr.

Left at Bird Park Jct.

Veg. a Styphelia-Dodonaea scrub with scattered small lehua, becoming rapidly sparser till more ground than scrub shows.

Observatory. Much steam coming up from all around pit, and from many places on caldera floor. Drizzly weather probably makes much more steam.

Vegetation on this high ground both sparse and depressed. Ground of rounded low tumuli covered by ash. Bulbostylis abundant in open ash. Down hill both scrub and trees become more dense.

Where road flattens out again view left shows very sparsely vegetated ash beds on lower level.

Then a bare watercourse. Then road is down on lower level. Vegetation very sparse - scattered lehua 1-3 m. tall, small Styphelia + Dodonaea. Thin Bulbostylis Conyza and tufts of several

weedy grasses. The ash surface here is somewhat indurated into a crust. Where extreme almost no vegetation south of Halemaumau.

But in a bowl shaped depression to left of road a dense mixture of shrubs - Dodonaea, Styphelia and weedy grasses, sedges, Desmodium, etc. on fine black sand.

Beyond here rolling land with very little vegetation - an ash desert. Gnaphalium sp. scattered with Conyza can. and an occasional little tuft of Dubautia, Styphelia etc. on places where loose ash has accumulated on the indurated layer.

Cross a series of cracks which are the s.w. rift of Kilauea.

Then a low pumice field with notable weed veg.

Desmodium uncinatum

Plantago lanc.

Sporobolus elong.

Setaria

Verbena bonariensis

Cyperus compressus
Oenothera stricta
Linaria canadensis
Cynodon dactylon
Hypochaeris rad.
Bidens pilosa
A few clumps of
Rumex giganteus
and Dodonaea
Pennisetum ruppellii
and a ~~couple of~~ unknowns.
Silene struthioloides

Surrounding area on this side of Halemaumau an almost complete desert of ash and pahoehoe.

Halemaumau Overlook.

Up toward rim again more and more Styphelia and Vaccinium.

Boulders on flat here thrown out by explosive eruption in 1924

Upper flats have a sparse scrub, of Dodonaea Vaccinium Dubautia, Styphelia, lehua growing up thru a deep layer of fine pumice lapilli 1959

Keanakakoi crater – pummice field in bottom.

Low lehua forest beginning to recover from 1959 damage by

pumice a fumes. Deep lapilli layer.

Gradually changes to dense uninjured lehua forest with Sadleria understory at Kilauea Iki Overlook Jct.

Mar. 27 – Tree Mold Road

The road winds through open lehua woodland, similar to that along the main road, up over a low lava bluff.

On top is Styphelia-Vacc. scrub, open, with few trees ~~in~~ it, grassy. There is a considerable area of this, with, trees on it locally, but very scattered.

Around the loop at the end of the road are many young Acacia koa.

Here are a number of excellent tree molds, shells of ~~tre~~ lava that have hardened around tree trunks during a flow, before the wood has burned out.

Oenothera common

much larger than any trees in vic. now

Here also an excellent opportunity to observe transition stages between juvenile koa leaves with comp. blades and phyllodes.

1961 Hawaiian Is.

Mar. 26 – east of Kilauea
Military Camp, Hawaii
National Park
in low Metrosideros forest.

41758 Astelia menziesiana Sm.
1 common, terrestrial

2 59 ~~grass~~ Deschampsia nubigena Hbd. ?!
rare

1 60 Luzula ~~campestris var.~~ hawaiiensis Buch.
rare

1 61 Carex
rare

1 62 Setaria geniculata (Lam.) Beauv.
occasional

1 63 Vaccinium reticulatum Sm. ?
occasional

4 64 Stenogyne
local on broken rocks at base
of cliff

1 65 Cenchrus echinatus var. hillebrandii

Mar. 26 – near Volcano House,
Hawaii National Park

2 66 Cyperus polystachyos Rottb.
very common in grassy meadows

1 67 Heterocentron ~~roseum~~? subtriplinervium
local in low weedy brush

3 68 Selaginella kraussiana A. Br.
abundant in wet place at
foot of cliffs on Sandalwood Trail

Hawaii

1220 m.

fruit yellow.

dense tussocks

bristles somewhat yellowish

leaves concave.

arching, scrambling
plant, [illegible] 2 m. long; flowers
bronze color. leaves concave.

1200 m

(L. & O.) A. Br. & Bouché

flowers white.

prostrate, forming
a loose mat.

Mar. 24 - Sulphur Banks,
Hawaii National Park
in open depressed area

41769 Agrostis avenacea
1 rare

1 70 ~~Cyperus~~ Fimbristylis dichotoma
very common, the only vascular
plant in lowest part of
depression

Mar. 24 - Flats southeast
of Halemaumau in
Kilauea Caldera, Hawaii
National Park

2 71 Rumex giganteus f. giganteus
occasional in open
pumice bed

2 72 Dubautia ciliolata (DC.) Keck
occasional on pumice beds

1 73 Agrostis avenacea Gmel.
rare on 1790 ~~ash~~ crusted
ash surface.

1 74 Gnaphalium sandwicense var. kilaueanum Deg. & Sherff
locally common on bare ash surface

1 75 Silene struthioloides Gray
locally common on bare ash surface

1 76

very rare on ~~th~~ pumice.

1200 m.

culms solitary or almost so,
prostrate, whole population
thus dwarfed.

1100 m.

clump 0.7 m. high; ~~mat~~
flowers light green; mature
fruiting calyx before
drying, ~~[illegible]~~ very pale green.

shrub 0.5 m. tall,
flowers yellow.

subshrub with thick
fleshy tap root.
prostrate

Mar. 27 - Crater Rim from KMC. + turn rt. at rim. Through irregular scrub swath along rim. - Note that the section of rim you are on is separated by a big crack on rt. Will eventually fall in crater. Polypodium pellucidum abundant. Smilax sandw. in trees on rt. Astelia under trees Sadleria cyath. very good here. Note anthocyanin in young lvs.

Bulbostylis in trail.

Note slight revegetation on lava lake.

Scrub here is of Styphelia, Lehua, Dodonaea, Gleichenia Vaccinium, Coprosma ernod. Sadleria, Machaerina ang.

After 100 m. or so cross at first opportunity to main ~~marked~~ travelled trail. 10^{15} m. away from rim.

Veg. becomes a bit sparser. More in cracks than on level ground.

Gahnia gahn. + Luzula may be seen near edges of cracks sheltered by bushes.

Open ground has lichen Bulbostylis, Hypochaeris, Conyza can

Colony of Polypremium scleranthoide in trail over 200 m. along.

Santalum in scrub.

Sphenomeris.

Scrub becomes more luxuriant, trees larger for a short distance. Santalum rather common. Then on rt. a large bush of Myrica faya, with conspicuous erect branches.

Shortly after, the vegetation again becomes ~~open~~ lower and more open.

Oenothera common in open places.

Veg. becomes lower, more open, lehua fewer, until there is as much or more open ground than veg.

Occasional great boulders near trail were thrown out by steam blast in 1924.

Veg. more and more sparse.

Then up a lava scarp - more small trees on ~~top~~ scarp (just before this, Trifolium pratense - tiny colony in ash.)

No trees on top, sparse scrub with consp. elongate Coprosma ernod.

Volcano Obs. Uwekahuna

1961 Hawaiian Is.

Lookout with good view of Caldera & Halemaumau. Circular faults, steam, etc. ~~From front~~ From high ground bet. Observatory and Kipuka

Mar. 27 – Kipuka Puaulu, ~~[illegible]~~ Hawaii National Park

41777 Hibiscadelphus giffardianus Rock
1 small planted tree in edge of mesophytic forest

1 78 Hibiscus hualalaensis
small planted tree in opening in ~~the~~ mesophytic forest.

1 79 Pisonia ~~inermis~~ ~~forsteriana Endl. ex Walp. & Schauer~~
common P. umbellifera (Forst.) Seem.

Mar. 27 – Crater Rim Trail bet. Kilauea Military Camp and Volcano Observatory Hawaii National Park

4 80 Santalum ellipticum var. paniculatum
common locally in mixed scrub

2 81 Polypremum ~~alternanthoides~~ procumbens L.
common in trail for a short distance, not seen elsewhere.

2 82 Myrica faya
single tree in mixed scrub.

Hawaii

Puaulu Jct. on clear day a very good view of the Kipuka and mosaic of vegetation on slopes of Mauna Loa.

1222 m

Tree 4 m. tall, flowering abundantly, ~~[illegible]~~ corolla maroon, curved, not opening.
– fruiting (fruits tardily dehiscent) –

tree 4 m. tall, flowering sparsely; corolla green, bright yellow green within, curved not opening.
–

small tree 5 m. tall.

1200 m.

shrub 2 m. tall, leaves dull, yellowish green, fruit immature.

1961

Air trip Hilo - Maui

Mar. 28 - N. slopes relatively solid wet forest above plantations, then a belt of grassland. ~~and~~ To west this widens downward with lower part a mixture of forest and grassland, to where it merges with Parker Ranch Pasture.
Above grass belt is a belt of scrub (and mamani forest?).
Above this the bare top of the mt.

Maui - Wet forest on steep slopes s. w. of Hana. Some clearings at bottom. Forest in Kaupo Gap, but grass below mouth of gap, forest on lower flow slopes or brush?
S. W. of Kaupo gap very steep, bare ~~[illegible]~~ deeply eroded slope - upper third scrub, lower bare or grassy.
Th

This deep erosion for about 1/3 or 1/2 way to Ulupalakua. Beyond this upper slopes scrub-covered, lower flow slopes bare, grassy.
Very top of Haleakala bare red ash.

Maui

Grassy slopes just below scrub in western part with scattered trees, becoming denser to west of Auahi, westward, also, the scrub belt becomes thicker and taller, perhaps some lehua forest.
A road around into this - is this the Auwahi Rd? no??
Lower slopes & Isthmus kiawe forest, dense above, to open and sparse, almost savanna in lower flatter area. Savanna on flat part of Isthmus where not in cane.
Lower ridges of W. Maui, s. of Iao V. badly eroded. S. shoulder grassy in lower 3/4.

Trip around East Maui by car
start. 10 am.

94.9 Airport. Kiawe etc. Cane fields ~~[illegible]~~ with Grevillea wind-breaks.
Then cane without wind breaks to near Pukalani jct. with a few Eugenia cumini, kiawe.
Pineapples + pasture.

03.9 Pukalani jct.
Pineapples + pasture, to Eucalyptus plantings
Upper Kula rd.
Jacaranda, Araucaria, Casuarina in small numbers. Cupressus also

Considerable Eucalyptus
plantation. Grevillea
and Jacaranda.
Pasture with ~~some~~ Opuntia.
Ipomoea indica on fences.
Acacia dealbata abundant at
higher levels.
10.6 Haleakala Hwy. Jct. Upper Kula Rd.
Pasture with small farms,
gardens - Temp. zone flowers
and vegetables.
Eucalyptus & Acacia dealbata
plantings and Thickets.
Foeniculum vulgare very
common along rd. Cupressus
macrocarpa planted.
Walker Rd. to Polipoli Spr.
Acacia dealbata ~~in~~ forest
below road, farms above.
then farms below. Higher
slopes pasture.
Thorn Lantana, mostly
leafless, on lava flows.
16.6 Kula Sanatorium at Keokea
Then pasture largely
invaded and dominated by
Lantana, locally much
Opuntia.
(Pond on Isthmus visible
at head of bay).
18.3 Views of Kahoolawe ahead and
Lanai to rt.
Ipomoea indica along rd.
Abutilon molle. much Opuntia

and Lantana.
Views of Molokini & Kahool.

Passiflora sp. with trifoliate lvs,
white fls. large stipules,
green fruit turning yellow
common on walls and
bushes. Kalanchoe abundant.
Melia trees scattered
in pasture.
21.5 Jct. Makena Rd.
Kahoolawe - red top.
Eucalyptus planting.
Ulupalakua Ranch.
Old mill ~~smokes~~ chimneys.
23.6 Jct. with Kanaio Rd.
Bocconia frutescens on left.
Cinder cone with guava
scrub, cut in black sand,
on left.
Lava beds and cinder
cone below on rt along
coast. [illegible] below
road on rt.
Open Lantana scrub on
weathered aa flow. with
Kalanchoe.
Scattered Reynoldsia
trees. Nicotiana glauca
on aa. Dodonaea.
Hunnemania mex.
very common. Some
Leucaena.
Bare cinder cone on rt. Pimoe

Open Lantana scrub.
Nic. glauca common along rd.
Weathered aa.
Black lava below along
coast.
27.2 Aa with sparse Dodonaea. some
Opuntia. very bare lower
down.
29.0-.3 Scraps of dry forest
with Diospyros, Reynoldsia,
Myoporum, Canthium,
Nothocestrum, Argemone,
Erythrina, Ipomoea tuboides,
I. indica, Zinnia elegans (naturalized)
Mirabilis, Nicandra
Hunnemannia, Foeniculum,
Bidens pilosa, Opuntia, Sonchus,
Amaranthus sp. Nicotiana.
Lantana. Tridax, Silene gallica,
Leucaena, Cynodon, Passiflora sp.
Nothocestrum latifolium,
(on left by rd.). Chenop. oahuense,
Then pasture with Leucaena,
Lantana, Nicotiana, Opuntia,
with a few Erythrina.
Fourcraea below on ~~left~~ rt.
Opuntia very abundant on left.
29.4 one Prosopis tree. Much Lantana.
/ 3 cinder cones on left. with
29.9 Lantana scrub and some grass.
Same on rt. below.
Patches of Erythrina below.
30.7 Another cinder cone on left.
patch of Reynoldsia + Erythrina

just below rd. on rt.
Then open Lantana scrub with
scattered Erythrina and
Myoporum. Canthium.
Occ. Diospyros + Lehua
and ~~[illegible]~~ Aleurites.
Argemone.
32 Patches of scraggly lehua, Dodonaea,
Erythrina, Diospyros, etc.
Mostly Lantana.

Xanthium, Abutilon molle,
Nicotiana, Solanum
sodomaeum, along rd.

Lantana above, grass below.
Very rocky. Soil gone.
Occ. Erythrina, much
Opuntia — grass with
Lantana.
33.5 Verbesina common.
Have been descending for
some time.
Very rocky, little Lantana,
rather little grass.
Occ. Dodonaea + Canthium.
much Opuntia. Some Leucaena.
34.0 more grass, less Opuntia.
Argemone common.
Locally much aa
34.6 Erythrina in ravine.
This aa probably exp.
by erosion.
36.7 Grass, less ~~rock~~, rocks on

lower, gentler slopes, just
above ocean. Manawainui g.

36.4 dry gorge. Euphorbia sp.
depressed, shrubby. on walls.
Low grassy slope. some pili

37.5 another, ~~a~~ smaller gorge Kahaleaimalani g.
with abundant Euphorbia.
atriplex, Sida. Stop. Turnstone

37.8 Another. prob. better stop.
From here - grass. occ.
kiawe, etc. in ravines.
12. noon. Pebble beaches.

38.2 gorge with flat rocky bottom
Thin Prosopis savanna.

39.4 Prosopis thickets on rt.
Savanna.
Nuu - bay with old landing.
Prosopis thickets. Ocimum
common.
Prosopis - Leucaena scrub
with Opuntia and a ~~few~~ many
Erythrina

41.0 grassy slopes.
Much Opuntia. Zinnia common.

41.6 Leucaena scrub on ~~left~~ rt.
then on both sides.

42.1 Guinea grass pasture + Leucaena,
Schinus

42.6 first farm
Mouth of Kaupo gulch.
Eugenia cumini.
Church. rt Thevetia thicket on left,
Pandanus on left.
Much Leucaena, some Schinus

occ. Kukui. Kaupo area.
Farms. Leucaena.

44.4 Kaupo school.
Gorge with waterfalls on
left. View of Kukui
patches on mt.
Erythrina patch on left

44.8 Stream with Eugenia,
Psidium, etc. Then a
rt. Thevetia thicket.
Then low Psidium catt. -
Eugenia + Schinus forest.
Kukui in ravine.
Spectacular rocky coast.
Windsheared Schinus
Euphorbia scrub.
Hau - mango forest. kukui
bananas in gulch.
Euphorbia + Osteomeles
on cliffs on left.
Hau - guava.
Mango, guava, Psidium catt.
on steep slopes. sea bluffs.
Mango forest with
Pandanus.
Fourcraea with Eugenia
cumini.

46. cliffs.
Wet valley with kukui
mango. hau. Waterfalls.
~~Psd~~ Psidium catt. Cocos.
breadfruit.
Ten spread up from this
Canavalia microcarpa on rt.

in hau-guava thickets. Stachytarpheta urticifolia abundant.

Pastures.

More Psidium spp. Mango thickets. Kukui in ravines.

Pastures.

More thickets. [illegible] sed a~~lternat~~.

Tuff cliffs bare.

Gulch with scrub of Euphorbia + Osteomeles on s. side cliffs Pandanus + Scaevola on n. cliffs. Guava scrub in bottom.

Cliffs - some Scaevola, mostly bare tuff cliffs.

Pebble beach. Canna in bottom of gulch. Scrub of Lantana, Euphorbia, Waltheria on sides.

Sea cliffs, with Euphorbia, Scaevola, Pandanus.

Gulch with hau. thickets.

Terminalia by small bridge.

Cliffs. Pandanus above. Fourcroya.

Wooded gulch with Mango then Spondias, Ceiba, Mango, Cocos, etc. Eugenia cumini around farm.

Pastures.

Guava, mango, Eugenia forest. More Pastures, with

thickets; mango trees dominate landscape.

Guava, mango, Pandanus, breadfruit, bananas, Coco.

Mango and Leucaena + pasture. some hau. mixture to Kipahulu with old mill ruins. Terminalia grove on rt. Village. with Araucaria and many ornamentals.

Another Terminalia grove.

Grassy pasture slopes, on left, very green. Thickets on rt. and in ravines.

Terminalia and Eugenia trees along road. Milo on left.

5r.2 Seven Pools. - beautiful cascade in gorge.

Canavalia microcarpa at end of bridge. Pandanus below - otherwise no native plants. Thespesia, Eugenia, Terminalia, guava, Cocos, Lantana, Plumeria (in cemetery ~~yard~~).

Pasture

Gulch with Pandanus. Eug. kukui. Waterfall.

Pasture + thickets.

Gulch with Pandanus forest on opp. wall

hau, kukui, mango, Eugenia, ti, guava

Gulch with Eugenia-mango
forest.
Guava-lan.-Eugenia-mango
thicket on bluffs.
Pennisetum purp.
Ipomoea indica

General ~~[illegible]~~ mixture
of the same thickets
and pastures on bluffs
and in small ravines
54.9 to Wailua Gulch, where
there is a beautiful
Wailua Falls waterfall in a grove
of kukui and breadfruit.
Alocasia macrorhiza (ape),
~~a~~ torch ginger, red ti
in Commelina slopes
below falls. Thelypteris
parasitica. Schizostachyum
clump to rt. of falls.
Ipomoea indica festooning
cliffs. Colocasia. Dioscorea
bulbifera rare.
On wet rocks alga., much
Selaginella menziesii, ~~a~~ some
Pilea peploides, a bit of Adiantum
sp. and on drier rocks, Polypod.
thunbergii.
By road Zebrina pendula.
Oxalis martiana, Panicum
maximum, Euphorbia glomerifera
Canavalia ~~[illegible]~~ microcarpa
on tree. Drymaria cordata.

Maui

Bananas between 2 bridges.
Breadfruit abundant.
Bridge over second stream
labelled Wailua.

houses and many kinds
of planted trees – Koali
Village.
Mango trees. Pasture.
57.5 Farm with Macadamia
planting on left.
Milo trees a little beyond on
rt. Coconut trees in
pastures and thickets.
Small farms and dwellings.
many Terminalia, Artocarpus,
Mango, Cocos Pandanus.
Papaya Samanea (defoliated)
Calophyllum, etc.

Scaevola scrub on
sea bluffs.
Farms & pasture.
Wide level pastures
59.9 Hamoa Beach Rd.
Pasture invaded by guava
on level ground. thicket
and pasture on lower slopes.
Kukuis in pasture on rt.
hau also – round clumps.
Wooded cinder cone on
rt – Melaleuca.
Casuarina planted
just above beach, as windbreak.

Kukui along ravine to rt.
Guava thickets on rt.
Pasture & stock pens.
Row of ~~ta~~ Araucaria and Casuarina leading into Hana.
Cinder cone on point wooded with Casuarina
62.7 Hana. 2 p.m.
Crinum procerum – fine row on rt. by hotel.
Beautiful Hana Bay.
Lighthouse on point.
Old Casuarina trees.
Pastures to rt. Houses and trees, wet lowland forest to rt. Tall Araucaria.
Breadfruit very common. Bananas, Pandanus, Eugenia, Terminalia, guava, mango, Spathodea Carica Persea, etc.
Pastures & thickets.
65.6 Pandanus forest on rt.
Extensive pasture, guava brush on slopes above rt.
Road is well up on slope past patch of Pandanus forest down on coastal flat to rt.
Wooded ravines in pasture.
Banyan trees planted along road.
Kukui with Eugenia malaccensis, guava, etc.
Guava – Eugenia mal. ~~Sp~~ Spathodea thickets.

69.7 Large banyan.
Then several large Eucalyptus robusta.

Guava forest below, pasture, much invaded by guava, above.

Pasture, with a few Manihot glaziovii
Eugenia jambosa groves in pasture.
Heterocentron roseum along road.

71.5 Pasture gives way to thickets and forest, Gleichenia.
Much land has been cleared for pasture, but overgrown largely by guava, Gleichenia, etc.
72.5 Some lehua, koa, many planted trees, mostly guava thicket.
Pastures more and more overgrown. Gleichenia and guava most abundant
Some farms and pastures on slopes.
Koa more and more abundant, some lehua.
Many planted trees Melaleuca, Eucalyptus
75.5 Pua Kaa Park.

Koa very common as far as
ridge before Waiokani Falls
Schinus very abundant
above ~~[illegible]~~ Wailua Taro
patches. Much hao and
~~H~~hala forest on flats sea-
ward of taro. hao on slopes,
also.

82.5-.6 Beautiful views along coast
line, then another of Nuaailua

84.8 Beautiful view of Honomanu
Gulch with side ravines
full of kukui.

86.5 Kaumahina Park
planted Eucalyptus and
Acacia confusa Melaleuca
leucadendron.
Many aroids ginger
Impatiens sultana
collection of Cordyline term. var.
Beautiful view of Keanae
Pen. from lookout.
~~X~~anthosoma sp.
Dieffenbachia picta
Scindapsus aureus
Philodendron lacerum
Heliconia humilis
torch ginger
Costus sp
Cibotium cham. & glaucum

87.8 Bet. Kainapuna Puohokamoa
Gulches - Eugenia malaccensis
trees along ~~rd~~ rd. on rt.
fruit July & Aug.

00.0 Gulches before Peahi
have Pandanus, kukui forest.

12.1 Prosopis forest along beach
near Spreckelsville. Cane
plantation to left of rd.

14.3 Puunene Jct. 4:20 p.m.
Road in cane fields lined
with Spathodea
Cane to Puunene Mill
Jct. on main st. in town,
Giant Enterolobiums to rt,
Samanea to left. Cross this.
More cane for a long way.

19 Cane on left savanna on
rt., then on both sides.

20.9 Cane on rt. Prosopis forest
on left - thick, to 8-10 m. tall.

21.9 rather open low Prosopis forest
on both sides, then very
dense. 10-12 m. tall.

22.9 Sea. ~~[illegible]~~ turn rt.
Prosopis forest on rt.
houses along beach.

23.3 Flats of Batis maritima
Kealia Pon along road, bet. road and
pond. Atriplex semibaccata
& A. sp. also Sesuvium
and bare salty areas.
On other side a strip of Batis,

Then Prosopis forest.
Bet. road and beach a sand strip of both Atriplex ~~[illegible]~~ with Chenopodium murale & Setaria vert. ~~[illegible]~~ and on beach ridge Sporobolus virginicus & Sesuvium. Ipomoea pes-caprae.

24.8 Outlet.

25.8 end of Batis flats. Beginning of cane fields.

Slopes of West Maui on left lower slopes and bluffs grassy.

26.4 Jct. Lahaina Rd. Turn rt. Kiawe & Leucaena on rt. Then cane fields.

Gulches on left brushy, ridges grassy & eroded into dark red dirt.

Most of alluvial fans wooded until just before Waikapu, where a large fan is being put under cultivation. From here on all are in cane.

Samanea trees along road on left. from Waikapu to Wailuku.

31.9 Wailuku. 5 p.m.

Royal Palms on left, on street entering. (High St.)

Kanaha Pond Wild Life Sanctuary
Maui Traffic and Planning Commission has plans to develop this, with picnic areas, etc. (County govt.)
Robt. Ohata OHATA.

Joe Medeiros is Chairman of Commission.

Plan A provide extensive picnic areas on land, some of it to be filled, in center of pond. Parking areas on all side. Magazine areas to be retained in pond.

N.C. is Audubon Soc., should look into this.

Flight Maui to Honolulu —
Lower slopes of W. side W. Maui are in sugar, that is, the flow slopes bet. the gulches.

Molokai — s. coast —
considerable ~~[illegible]~~ development. but with gaps at mouths of streams. Lower half of slopes, including all the flow slopes are in pasture, except kiawe forest on lowest parts. Upper ridges and slopes forested and shrubby brush in upper gulches. but some of the western ridges are terribly eroded up to not far from tops. and farther west the grass goes almost to tops. Lower slope and ravines in open Prosopis forest or savanna (upward).

Green grassy area ~~in~~ back mangrove swamp [illegible] be Batis. A few bare areas in them.

Some red silted areas also. Dry scrubby vegetation, probably Prosopis, grass, and eroded areas. Grassy slopes being actively gullied.

Mamoni sand slug seems to be almost all wooded now.

Savanna and briawe forest on west end. Also a depression back of main western beach that may be a marsh surrounded by briawe forest.

1961 Hawaiian Is.

March 28 - Kealia Pond,
south side of Isthmus

41783 Atriplex
abundant on sand back of beach

, 84 Atriplex
common in edges of saline
flats around pond, in sand

~~8~~ Auwahi, w. of Luala'ilua Hills,
Mar. 28 - south side of
Maui, ~~0.5 mi. beyond Ulupalakua~~
on dry aa lava slopes

1 85 Ipomoea tuboides v. Oostst.
common

1 86 Diospyros ferrea var. pubescens Fosb.
~~[illegible]~~ occasional in remnant
of dry forest

Kahaleaimahana gulch, Manawainui,
Mar. 28 - ~~[illegible]~~, south
side of Maui

4 87 Euphorbia
common on cliffs of small
gorge

Mar. 28 - Wailua Falls,
2 mi. s.e. of Hana

1 88 Artocarpus altilis (Park.) Fosb.
very common in gulches
along road.

2 89 (alga) Oedogonium sp., + Cladophora sp. + mostly Pithophora sp.
abundant on rocks in falls
det W. J. Gilbert

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1 m.

erect.

much branched bushplant.

485 m.
~~Beach~~

flowers white.

small tree.

60 m.

prostrate lactiferous shrub.

50 m.

~~tree~~ fair sized tree.

1961 California

Apr. 3 - Los Angeles - Tucson
(Constellation, left side 5:30 p.m.)

El Segundo sand dunes are completely covered by oil refinery and houses.

Palos Verdes Hills - a low density development, with areas not occupied by houses either in a golf course or very well manicured. A few scars on hill tops that look like sand diggings, and a big quarry and a nearby area graded in horrible terraces squares presumably for building.

Santa Ana Mts. have very considerable areas of chaparral intact, also a road up to a radar station on a peak near the summit. Rocky areas large.

Hills east of here dry bare, little if any chaparral.

San Jacinto Peak with no visible snow. Upper peaks and ridges very rocky, almost bare of vegetation. West slope of summit peak looks as though it had dwarfed alpine vegetation. Considerable forest in upper valleys and canyons.

In valley by Palm Springs

and Indio what appears to be a dry lake - cultivation intermittent on either side of it. Part of the bare area apparently laid out in house lots.

Is this Salton Sea - if so, it must be dry.

Morongo Valley still untouched except for road

Little San Bernardinos as dry and bare as I remember them. Chocolate Mts. also, though there seems to be vegetation in the bottoms of the canyons.

Several parallel roads along L.A. aqueduct, across vast series of bare fans, coming out from a long straight mountain range front, undoubtedly a dissected fault scarp. Some sand along this, and especially a large pile of it near the eastern end of the broad valley through which the aqueduct runs.

1961 Arizona

Apr. 1. - Tucson - Chicago (707 jet, left side) (departed 10:15 a.m.)

Valley above Tucson - for some distance a series of complicated washes braided on the floor of a broad flat valley. Small check dams. Small ravines cut into desert floor.

Then a rather large wash with considerable vegetation immediately adjacent to main stream beds.

Upstream this forks into many small streams in a dendritic pattern. All this is fairly undisturbed desert.

At head the course passes over an imperceptible divide into another stream system. This river runs off to the left, with dense woody vegetation and a few green cultivated patches in bottom land - open desert otherwise. Mountains to left of this well wooded at higher altitudes.

Beyond here very sparse desert vegetation on not very rough land. Then a cultivated valley with a

small town and air strip - the cultivation all well above the town - apparently alkali flats below, with small reservoir. Wooded mountains in distance to left.

Rough desert country below. Scattered small trees on mountainous parts, sparse scrub on more level parts, more dense along watercourses.

Then another village with rather extensive cultivation. This valley leading northward with much cultivation in far distance.

Open desert country with buttes - very sparse scrub except slightly denser along ~~stream~~ water courses.

Then gray low mountains with extremely little vegetation, but this strikingly greater on north-east slopes than others.

Another, much narrower, cultivated valley - cultivation only on bottom-land.

An enormous strip mine in distance toward head of this valley.

vegetation on slopes leading down to this valley very sparse.

Country gets rougher, leading up into a wooded plateau or gentle slope eastward from an abrupt scarp which falls off abruptly to west. Eastward this slopes off into gently dissected country that is grassy except in ravines which are sparsely wooded or brushy.

Generally mountainous but not too rough, locally wooded to north.

Then a very rough mountain mass, very high, with coniferous forest with traces of snow on northeast sides of crests, on course – this extensive, extending n.e. in a high, gently dissected plateau, well wooded, with, farther n.e., some areas of grass or very open or sparse forest, a ~~[illegible]~~ high-wooded peak~~s~~ with mountain meadows near ~~top~~ on north side.

Generally mountainous and wooded country in this whole area except for

extensive grasslands in distance to left.

Then large grassy patches closer by where terrain is flat.

A mosaic of wood and grass on an apparently high plateau. Snow locally. This for some distance with variations.

A conspicuous lava flow. Then, about 50 min. from Tucson, a great snow capped peak, isolated, on immediate left, Redondo Pk. A snowy range in distance. A lava mesa just east of it.

Then at just under one hour out, the Rio Grande Valley, and a great rugged range east of it. The bottom lands intensively cult. the slopes desert, very sparsely vegetated. The Mt. range mostly wooded, with a sharp crest, snowy on east side. Extensive snowy mts. far to north.

Lower wooded mts and large plains areas along course. Some large scale cultivated areas.

Then mountains again with pine forest and many high very snowy peaks extending to north from a belt of lower wooded mts. and hills across course. This mostly sparse low wood - possibly pinyon-juniper, much grass, esp. eastward where it gradually fades into desert grassland. Some incised meandering streams. Vernal pools? Typical high plains. mostly thin grass. Shrubby areas locally near water courses. Mosaic with some forest to left. Snowy Mts. in distance.

Detail of vegetation pattern in plains below very interesting with relation to water courses, low erosion remnants or mesas. Would be worth examining on ground.

Rather large reservoir on immediate left.

Along river below this, extending and meandering eastward, ~~or southeastward~~, some very severe erosion,

exposing bright red material. Course follows this river. Vast grasslands, erosion wherever there is any relief.

Then, very locally, some cultivation, but here away from river. No bottom land cultivation - no bottom lands. Cultivated areas larger eastward. Grass between them but rather sparse. Scattered sand dunes along the course of river but a little way on other side of it. River becomes notably larger. Water a red color, sand bars pale tawny. Sand dunes also tawny. No more cultivation after ~~sand~~ ~~to~~ beginning of sand dunes. After sand dune area vast plains locally with many vernal pools and small ponds the latter formed by damming small water courses. Still some erosion, locally serious.

Then ~~[illegible]~~ river augmented by a large tributary from northwest. Much cultivation in distance to north. Gully erosion locally very conspicuous, especially south of river. River ~~Crossed to north side of river, then~~ gets larger, gets closer to large cultivated area on north. Extensive plains on both sides of river. There have been no trees along this river nor along its tributaries.

Small city to south of river. Bleak! and what appears to be an oil field ~~-~~ east of it.

Course still parallels river. Tributaries are dry and very sandy. River bed wide and braided. Terrific gully erosion in complicated dendritic patterns on both sides, especially the south side. Vast cultivated area not far north of river.

Crossed river at 11:50

Partly cultivated, eroded plains, more intensive cultivation to north. Becomes more spotty to northeastward. Much open thin grassland. Laid out in squares marked

by-roads.

Then a red area, rather deeply gullied. Rather a lot of cultivation to north.

Many dammed up gullies forming small ponds.

11:58 crossed a broad braided river course at right angle. No conspicuous woody vegetation. Then more dendritic gully systems cut into red plains. These gullies beginning to have woody vegetation in them, flat between them grassy, gully slopes bright red and bare.

Scattered cultivation.

Red area very large.

Gullies now generally wooded and ~~[illegible]~~ river bottom lands cultivated. At about 12:05 land becomes generally cultivated - some small grassland areas. but 80% of area under cultivation.

12:25 Topeka and Kansas R.

Chicago - Baltimore - (left side DC-8)

3:35. North over lake, then east. Crossed shore where it turns north. A nice area of wooded dunes - 3 ponds at north end, some sand excavation at south end. highway passes on land side.

Country to east intensively cultivated, but many small lakes and wooded meandering stream courses. Not very green at this season.

A very few small wood-lots.

South west part of Lake Erie has a ~~some~~ small archipelago of islands of varied sizes, mostly largely cultivated.

Locally in n.e. Ohio an appearance (from 27000') of some snow remaining in elongate patches, as against fences, etc.

Just before landing crossed what may be a small serpentine barren. Open dry grassy land with a few small pines. On left of a paved road going northeast toward Baltimore. Not a large area. Possibly only an abandoned pasture.

April 10 - Mall side of Capitol Bldg. - Magnolia grandiflora on the two sides of the capitol steps have become a bird roostery since the Capitol has been wired to drive the starlings and pigeons off the building. The result is a layer an inch or more thick, on the ground and on the branches, of guano. The magnolias, as well as Ilex opaca and Ligustrum ~~and~~ (Calif. privet), have become largely defoliated and seem to be in very poor condition. The remaining magnolia leaves are browned in spots where splashed with guano. Even the small twigs have an accumulation of guano. Not a plant of any sort is growing on the ground under the trees. However, even before the invasion of birds nothing much was growing there. Now, of course, there is almost no shade to have an effect.

1941 Virginia

April 16 - Balls Bluff
Flowers in bloom in
deciduous woods on slope
Saxifraga virginica
Hedyotis caerulea
Antennaria plantaginifolia
Claytonia virginiana
Amelanchier arborea (Michx.) Fern.
Dentaria laciniata
Dicentra cucullaria (L.) Bernh.
Dicentra canadensis (Goldie) ~~Raf.~~ Walp.
Viola ~~pubescens~~ hastata ? glabrous yellow
Erigenia bulbosa (Michx.) Nutt.
Jeffersonia diphylla (not flowering)
Caulophyllum thalictroides
Hydrophyllum virginianum (not fl.
Sanguinaria canadensis (past)
Trillium sessile
~~[illegible]~~
Podophyllum peltatum (buds)
Erythronium americanum
Mertensia virginiana
Viola cucullata
Asimina triloba (bud)
Acer ~~rubrum~~ saccharinum (young fruit)
Lindera benzoin
Smilacina racemosa (not fl.)
~~Nepeta~~ Glecoma hederacea
Corydalis flavula (Raf.) DC.
Stellaria media
Alliaria officinalis (buds)
~~Stachys sp.~~ Lamium purpureum
Erythronium album
Thalictrum thalictroides

Dodecatheon meadia L.
Luzula campestris v. multiflora
Sedum ternatum (not fl.)
Carex sp.
Carex sp.
Asarum canadensis (buds)
Arabis laevigata (buds)
Asplenium Trichomanes
Asplenium schizophyllum
Asplenium platyneuron
Cystopteris fragilis
Polystichum acrostichoides

Barbarea vulgaris (buds)
Heuchera sp.
Danthonia spicata (not fl.)
Stellaria pubera
Ranunculus abortivus
Viola striata
Galium aparine (not fl.)
Lonicera japonica (not fl.)
Veronica hederaefolia
Poa ~~sp.~~ cuspidata?

April 23 - Great Falls, Va.
Phlox subulata in
full bloom on rocks
below falls - mostly white,
a few pale purplish.
Saxifraga virginica
Ranunculus abortivus

Labels typed

1961 Virginia Loudoun Co.

April 16 - Balls Bluff,
Potomac River east of Leesburg
in Deciduous woods on
river bluffs

41790 Viola cucullata Ait.
1 occasional
flowers rich violet,
center dark.

1 91 Viola papilionacea Pursh ?
common
flowers light violet.

1 92 Veronica hederaefolia L.
abundant
prostrate; corollas bluish,
falling very easily.

1 93 Lamium purpureum L.
common locally
erect bracteal leaves
dark purple, corolla
rose pink.

1 94 Poa cuspidata Nutt. ?
common
small loose tufts.

May 15 - Utrecht -

Lawns with abundant Bellis perennis.

Pastures with abundant Ranunculus acris.

Crataegus flowering.

Sorbus just past.

Curious form of Hedyotis caerulea in Bep Mennega's garden. (Said also to be in Edinburgh Bot. Gard.) Is same as seen in Baarn in 1948. Certainly closer to H. michauxii.

May 20 - rail from Leiden to Utrecht.

Polder landscape - rich green grass, cropped rather short. Land cut by ditches into long rectangular checks. Ditches have some marsh plants - Iris pseudacorus, rare clumps of Salix. Water surface partly covered by Lemnaceae and floating felt of green algae. Small carefully tended gardens near r.r. tracks. Soil almost black. A few weeds, e.g. Barbarea, Brassica, etc. but not many. Sheep and cattle in moderate numbers.

white umbellifer

Toward Utrecht rows of pollarded willows and poplars become common and dominate the distant landscape.

Small orchard near Woerden, but country is dominantly meadow. Some hay being dried, but not much.

A little Phragmites communis along ditches along r.r.

Rather large orchard of apparently dwarf trees recently planted.

Meadows have more Ranunculus and other conspicuous flowering plants.

More orchards. Small patches of Alnus - Salix - Populus wood. Rows of pollarded trees and orchards more abundant toward Vleuten.

Gardens, cold frames and commercial greenhouses common just beyond Vleuten.

Ground has gradually become somewhat higher toward Utrecht.

May 15 - Utrecht - Arnhem - to Germany. lv. Utrecht 9:20 a.m.

Landscape much more dominated by trees. Meadows with flowers separated by rows of trees, Crataegus hedges, patches of wood. Beeches, pines, oaks are prominent also Betula. Thickets.

Open pine forest with deciduous

understory. Some Picea. Much young forest – planted? Pine is the most prominent larger tree. Young pine is notable, but many other young trees – Populus tremuloides, Robinia? Stands of pine generally have a broadleaf understory, but this is inversely prominent according to thickness of pine stand.

Thickets along tracks in places obscure view. Cytisus scoparius is locally common on rr. embankment, also Calluna. Mostly grass or planted rye. Mixed agriculture, mostly dairying

9:44 First low hill or knoll. But this is isolated in generally flat country. Soil becomes gray rather than black, but this varies locally to yellowish or brownish.

9:50 Ede-Wageningen.

More low hills. Cuts with heather. Country becomes gently rolling. Patches of rather young pine forest (P. sylvestris). Heather along tracks in rather broad strip. Some Cytisus. Scattered young oaks, birches, Populus. Thickets and patches of small oak.

The heather quite local. Oaks and other broadleaf trees dominate landscape generally.

Hills slightly higher near Arnhem. Robinia abundant with oak.

Left Arnhem 10:17.

Flat country, but hills in middle distance to left and in far distance ahead. Salix alba, mostly pollarded, common. Meadows with abundant Ranunculus.

10:32 Some thickets and patches of pine forest. Cytisus locally common along tracks, flowering.

Mixed hedges common, esp. along rr. Crataegus and various other shrubs and small trees.

10:47 Small orchards. Mainly grain fields, meadows. Ditches along tracks and roads with some water or mud, marsh plants, shrubs. Salix, etc.

Low flat wet land, mostly meadow.

10:52 Very slightly higher. slightly rolling, mainly grain fields. rows of trees, small orchards.

Just beyond Mekrhoog some

1961 Germany

fairly large patches of pine woods. some Picea, birch, oak.

10:59 Some small swamp forests. Still large pine woods. Several generations of plantings. Considerable birch. Robinia. Rolling land.

11:04 Wesel. Much industry in all directions. generally pasture with some thickets and woods. Cytisus locally abundant in waste spots and along rr. Rumex acetosella (?) also. Woerde – grain fields, pastures, some orchards and woodlots, mostly oak, Tilia, etc. no pine.

near Dinslaken the soil has a thin dark layer. below this orange. Heavy industrial area, much smoke, from here to Oberhausen. Oberhausen is a huge horrible industrial expanse.

Arr. 11:23 Oberhausen Hbf. lv. 11:37

Low hills in distance to left.

Duisburg Hbf 11:42. lv. 11:45

Smoky industrial area continues. Some patches of pine wood. Then grain fields, largely rye and pastures. Rows of Salix along ditches. Some hedges, Crataegus, Sambucus. Woodlots – mixed.

Dusseldorf-Unterrath – Dusseldorf is another big horrible industrial place, but perhaps not so bad as Oberhausen.

Dusseldorf Hbf – arr. ~~11:59~~ 12:00. l. 12:05

Nice park (?) with many trees, ponds, etc. just out of city on rt. Then smoky industrial area.

12:13 Wide area of grain fields on absolutely flat land. A few rows of trees. Apparent woods in distance on both sides. Trees and hedges principally around houses and villages.

12:15 Langenfeld

12:19 another frightful industrial area – smoke and fumes limiting vision and almost as choking as in Cerro de Pasco. Nice gardens back of houses. Large strip of wood on left. Grain and potato fields.

12:23 Köln-Mulheim – more industry. Sambucus seems to be the dominant weed-tree in waste spots, rr.-embankments, etc. Platanus common street tree. Robinia abundant, flowering.

12:29 crossed Rhine. Cologne Station – dep. 12:52

Flat intensively cult. bottom land. Low bluffs in distance to rt. Vegetables, potatoes, fruit trees.

1:13 Bonn

1:18 Route at foot of bluffs starts to climb. Rhine immediately on left.

Then for some distance the rr. is along the river bank. The bluffs are heavily covered by houses.

1:30 Flood plain has broadened considerably and the bluffs are much less abrupt.

1:35 track again tightly squeezed bt. river and bluffs. Bluffs covered by dense mixed oak(?) forest, rather low and bushy but canopy practically full.
Occasional grassy spots invaded by bushes. Orchards in flood plain

1:49 plain wide, bluffs low, mostly cleared.

1:51 plain very much wider.

1:54 Koblenz. Commonest weed tree again Sambucus nigra. Crossed Moselle
Interesting castle to rt. of station.
The Rhine, this far, seems to carry a great amount of barge traffic

2:03 left Koblenz. Bluffs on rt. imposing.
Robinia is a common tree.
Raining rather hard.

2:09 crossed Rhine. wide here.

2:13 above Niederfahr—
High hills across on rt. a castle on hill to left.
Then high hills to left, wooded near tops. Flood plain intensively

gardened—mostly potatoes, between fruit trees.
Gardens on rather steep slopes on left.

2:18 rr. squeezed bet. river and hills.

2:19 Hills on both sides partly wooded, partly grassy, locally cultivated.

2:21 Some terracing and walling on other side, steeper slopes cult. Osterspai
Most of other side, though very steep, bare of wood, cultivated.
Valley here is very narrow. scarcely a flood plain.

2:28 Sides now steep, semi-wooded. This is the Rhine Valley as I had expected.
Visibility since Koblenz has been very bad because of rain.

2:35 Hills or bluffs partly densely wooded, partly open and semi-terraced.
All this part is very narrow. rr. even tunneled in places.
Some vineyards—small, on narrow benches of gravel or broken rock bet. rr. & river.

2:40 Spectacular steep semi-terraced slopes. Castle. several photos.

2:43 Wooded bluffs again.
near Kaub?
Castle on island. photo. (bad)
2:46 Spectacular churches and towers across river.
Lorch[hausen]?
Photo of castle across from Lorch.
Along here the towns are long and narrow, at foot of bluffs along river.
Vineyards on lower slopes.
Steeper slopes wooded.
Low wooded islands in river.
2:51 Fine ruined castle across river.
2:53 Another above a broad bar in river where many people are camping.
Vineyards on terraces and semi-terraces on left side.
Vines staked up on wires.
Wires running up and down slope.
2:55 Assmanshausen
Steep wooded bluffs on w. side.
2:56 Bingen across river. photo.
Mousetower on small island (photo?)
3:00 Rudesheim. Picturesque r.r. station.
Vineyards on e. bank slopes, and on lower w. bank slopes, dense woods above. Spectacular church on top of bluff on w. side.

Turned east along Rhine.

valley here much wider, more agricultural and less spectacular.
3:12 River is wide. Channel marked by levees, but water outside levees as well as inside.
3:14 Extensive vineyards on gentle slopes
Large islands in river.
3:20 Mixture of fields, orchards villages.
3:26 Wiesbaden – probably originally a beautiful city, but now industrialized to ugliness.

Main Valley is broad and rather flat. Vineyards, orchards, pastures, grain fields.
3:55 Hattersheim Main.
Much interplanting in all these orchards.
Strawberries abundant.
Sambucus abundant along r.r.
4:07 Frankfort am Main Hbf.
4:20 left Frankfort. Crossed Main.
Beautiful rows of Lombardy poplars.
4:25 Frankfort (Main) Süd.
Intensive truck gardening in orchards on bottom land.
4:28 Patches of open oak woods

1961 Germany

P. sylvestris

4:29 Offenbach.

4:30 fairly large pine forest on rt.

4:33 more patches of pine

4:35 Steinheim (Main) crossed Main again.

4:46 Patches of pine and spruce. at least 2 terrace levels along Main here.

4:50 Hills in distance on both sides and ahead. Thickets and trees prominent in landscape.

4:53 Aschaffenburg

4:59 Hills with planted Picea forests, some pine-spruce. lower slopes and flat or rolling valley land cultivated.

5:02 Forests on hills as much broadleaf as conifer.

Hedges of Crataegus, but few.

5:04 Hösbach

Hills become higher and a bit more rugged in distance on both sides. wooded, very neatly.

Woods of Picea, Tilia, Quercus, Fagus, [Prunus avium?], with very thin undergrowth except at edges.

5:08 stop in woods. Grain fields on lower slopes.

Laufach dep. 5:13

Beautiful valley, lower slopes cultivated, upper parts of hills wooded. Grain fields,

meadows and orchards.

5:16 R. is in low mts. now, partly wooded mostly mixed woods. Long tunnel.

5:27 Pine forests with an irregular scattering of beech, etc. Some of it has a definite second layer.

5:28 beautiful solid beech forest and patches of pure conifers.

5:30 Country wooded except flat valley bottoms and patches of slopes which are pastured or cultivated.

5:40 Valley now very much wider. Main R.

5:49 Gemünden.

Above, the valley narrows again - wooded sides, flat bottom with meadows, along Main.

5:52 Broadens out again.

Cultivated.

steeper slopes brushy or wooded.

5:55 Karlstadt (Main).

Above this rather wide flat valley floor, medium hills. partly wooded on sides.

A few trees along river.

6:08 Wurtzburg left 6:17

Marienburg Castle on hill opp.

Rolling hills, covered by grain fields, some thickets. Sambucus.

1961 Germany

6:28 Hills with open oak forest and thick understory of shrubs on rt.
Generally grain fields.

6:35 Uneven mixed forest on right.
The patches of scrub in the grain fields & the hedges seem mainly Prunus sp. with some other shrubs.

6:37 Extensive rolling plateau. Generally cultivated. mostly grain. A very few small orchards one or two woodlots, scarcely any hedges. Mostly vast open spaces, especially to left. Some scarps with scrub and scattered oaks.

6:41 broad low valley to left has large areas of pine forest.

6:43 Kitzingen.

6:45 Pine woods with some admixture of broadleaf trees, understory of Robinia, etc.
Then open fields. Then an oak forest, rather good: Then pine & oak patches.

6:46 Rolling open country. Some patches of wood.

6:48 Some rather abrupt hills on left.
Rolling open country with small trees along roads, etc. on rt., extensive.
Mostly grain fields.
This continues a long way

6:55 but finally wooded low

ridges in distance on each side.

6:58 ~~7:00~~ Ridges have come fairly close. Some fairly large areas of rather low dense forest. Some patches of pine.

7:00 Then more broad open valley with wooded low ridges in distance.

7:02 extensive patches of pine forest. Rolling land. Dark chestnut-red soil.

7:08 more pine, considerable area. slight admixture of beech, cherry, birch, etc. Picea, Quercus.
Generally open grain fields but large patches of forest.

7:12 Emskirchen

7:14 Patches of pine, spruce, some oak, Calluna in cuts. mostly open grain fields on rolling land.

7:16 perhaps as much pine as grain field.

7:18 considerably more pine than grain, open fields only in bottoms of shallow valleys. Some oak, birch, beech mixed with pine, also some spruce.

7:20 Flat open valley quite wide. pine on low hills on both sides. This for considerable distance.

7:25 Fürth 7:22 Nürnberg.

7:45 left Nürnberg.
Valley mostly thickly settled

1961 Germany

near Nürnberg, trees common. Then a patchwork of pine forest and grain fields. villages, Cytisus abundant on cuts, in flower.

Then the narrow flat valley bottom is open, the gently sloping sides wooded, mostly pine.

The pines in these planted pine forests are very closely spaced, even after the trees have reached full height, are very well self pruned. but not large in diameter.

Beyond Mohlstetten there is some heather. but only very locally in openings in pine woods. mixed with Cytisus scoparius.

8:15 still mostly pine forest, but a mosaic with fields of grain.

8:20 Open rolling country, only a few patches of forest.

May 21 - From Munich south in valley of Isar R. by auto

plain south of Munich is of Tertiary gravels. terraces. Terminal moraines.

Planted Picea forest with natural reproduction of beech.

Alpine species found here principally ~~only~~ on peat bogs.

Bavaria

(Timber line in north Alps. 1400-1700. Central Alps. 2400 ~~Southern~~ 1900 m.)

Agriculture becomes less to south, dairying more — too wet to south rainfall more than doubles.

Forest on edge of moraine

d Acer pseudoplatanus
Ulmus campestr
Sambucus
Fagus Picea planted
Tilia
10-12 sp trees
sc Lamium galeobdolon
a Aegopodium
Geum rivale
Anthriscus
Rubus
Colchicum autumnale
Asarum
Paris
Urtica dioica
Ranunculus lanuginosus
Listera ovata
Anemone nemorosa
Symphytum officinale
Pulmonaria
Impatiens noli-tangere

Munich 519 m.
Bad Tölz 659 m
Kochel See 599 m
Walchensee 802 m.

along Würm R. WÜRM

in Würmthal below Starnbergersee in flat ~~f~~ bottom of wide ravine cut in moraine.

1941 Germany

Low hilly land with beech forest, flat broad valley mostly in meadow. below Starnberg. Some planted Picea in beech forest. Orig. forest 90% beech. (Hueck)

Starnbergersee is in glacial valley. (much like Finger Lakes, N.Y.S. but in lower country.)

Extensive meadows, with mouse-brown cattle. rich flora of flowering herbs. on rolling land.

This morainal material is chalk and dolomitic in nature. Much planted Picea forest. This is between Starnberg and Wolfratshausen. These moraines are of small gravel and sand.

Isar Valley Loisach R.

On river deposits an open dwarf vegetation with much heather. Pinus sylvestris very open. Juniperus communis
Viburnum lantana
Erica carnea
Sorbus aria
Platanthera
Globularia

above Puppling ~ km. fm Wolfratshausen on Isar.

~~Put~~ Pupplinger Au
along Isar

Ligustrum vulgare
Daphne mezereum
Hedysarum comosum
Daphne cneorum (beautiful rose pink fls.)
Lathyrus pratensis
a Thesium
Carex pilulifera
Polygala chamaebuxus
Euphorbia
Psylla trilobum
Orobanche
Aquilegia vulgaris
Neottia nidus-avis ?
Polygala comosa

from alps
{Bellidiastrum michelii
Gentiana acaulis
Globularia
Primula farinosa}

Ophrys muscifera
Cypripedium calceolus
Listera

Peripheral area is open Pinus to 15 m.? 2-3 dm. with full shrub layer of Juniperus ground layer of Erica & moss. Then large area varying from open forest to savanna. Pinus to mostly not more than 30 m. and dense grass and some heather.

result of disturbance

Several Carex spp.
Convallaria majalis
Trommium ? (umbel)
Pinguicula

1941 Germany

from alps Dryas octopetala
Salix purpurea
Tragopogon (dark yellow)
Galium boreale
Polygonatum officinale
Orchis militaris
Astrantia major
from alps Alnus incana
Valeriana
Alectorolophus (Rhinanthus?
Plantago alpina ?
Tetragonolobus siliquosus

Gravel terrace dominated by Salix, spp. Alnus.
occ. Populus tremula no pine
Orchis militaris common,
Orchis latifolia
Chrysanthemum leucanthemum
Thalictrum aquilegifolium
Taraxacum vulgare
Potentilla silvestris

Several terrace levels, 1 m. or more apart, different stages in dev. of pine open forest.

Rosa alpina
Berberis vulgaris
Biscutella laevigata
Petasites niveus
Viburnum opulus

A little Picea, locally, brought from alps by river.

Euphorbia
affected by Puccinia forms elongate erect branches with broader shorter more scattered leaves.

Symphytum tuberosum

Away from rivers, on higher terrace an almost dense pine forest to 20 m. little undergrowth. except some Ligustrum
Lonicera alba
Crataegus
Amelanchier vulgaris

Flat open plain bet. Isar + Loisach. Meadows - surrounded by low hills, these densely wooded. Mostly spruce + beech. spruce mostly planted and reproducing
~~Great~~ Up the valley Picea tends to invade meadows.
Meadows in beautiful flower.
Königsdorf

1961 Germany

Above Konigsdorf a rolling to hilly land, mosaic of meadow with patches of Picea & Fagus forest, some bah, esp. rows. in Munich 500 - 600 mm Konigsdorf 900 mm.

Steep mountain slopes above Bichl are mostly densely wooded with Picea, Fagus etc. in an irregular mosaic. Snow on highest peaks. Timber line on first range 1400 m. Some clearings.

Baroque architecture very characteristic. Benediktbeuern church and enormous monastery a good example. Photos of landscape and flowering meadows near Benediktbeuern.

- Large open marsh ~~at below~~ from lower side of Kochelsee, cut for hay, with a few scattered trees, local peat bogs.

Above Kochel very abrupt limestone mountains. Picea and Fagus forests on them, very irregular mixture. Considerable Acer pseudoplatanus.

Beech forest with some Picea, Acer pseudoplatanus

Polygonatum verticillatum

shrubs
Daphne mezereum

Hepatica triloba
Maianthemum
Sanicula europaea
Melica nutans
Prenanthes purpurea
Fragaria vesca
Mercurialis perennis
Senecio fuchsii
~~Petasite~~
Adenostyles
Phyteuma
Cephalanthera
Neottia
Asperula odorata
Ranunculus montanus
Carex
Oxalis acetosella
Lilium martagon
Salvia glutinosa
Bellidiastrum
Carex pilulifera
Dentaria
Dryopteris filix-mas

1961 Germany

Valeriana montana
Coralorhiza enata
Primula elatior
Aquilegia
Streptopus
Lactuca muralis
Melica nutans
Galium sylvaticum

This seems to be about the general vegetation on the dolomite slope. Harvesting of timber is taking place selectively.

Pass and view of Walchensee photos (last 4) of Walchensee, forest and mts. around it. Mixed beech, maple, spruce forest on steep slopes of dolomite.

Bet. Kochel and Schlehdorf extensive marsh with Phragmites, local areas of sedge bog with Carex sp. Eriophorum polystachyum, etc. clumps of Salix. Betula along road embankment planted. Varying to wet meadow with Ranunculus, Melandrium, Rhinanthus on glacial outwash plain. (marl in lower layers, acc. Hersch).

Beyond Schlehdorf toward Murnau, flat meadows surrounded by partly wooded hills. Glacial ponds. Dense Picea forest with almost nothing beneath on low hills. Flat-bottomed valleys with ~~[illegible]~~ meadow vegetation - Aegopodium, Trollius conspicuous. extending up on low hills, with scattered Quercus petraea. Anthriscus exceedingly abundant, Tragopogon. Ranunculus, Chrysanthemum leucanthemum, Melandrium, Hieracium pratense, Galium cf. verum, Festuca elatior(?), Trifolium pratense, etc. in great luxuriance and abundance. Thickets along streams.

Ohlstadt.

Mts. rise very steeply like a wall from near here. Lowest forests on this line Picea. Then Fagus with Picea. on tops ~~and~~ Picea again.

West of Ohlstadt an ~~[illegible]~~ extensive marshy meadow, cut for

1961 Germany

hay. Many small haystacks also many small barns for hay storage.

Some spots in wet meadow have Trollius europaeus in abundance, Sanguinaria, Ranunculus, Orchis latifolia, Primula farinosa, Carex spp. Equisetum, Polygala Eriophorum, Clumps of Salix.

Large areas of Phragmites where it is very wet.

Murnau

S. of this rolling, low hills of fine gravel with grass, locally cultivation, thickets patches of Picea forest.

East through Ebersberg the hilliness increases a bit, somewhat more forest.

Near Seeshaupt - some birch forest.

Sternbergersee - narrow belt of Phragmites on shore. Where not occupied by dwellings and villages there are meadows ~~to~~ and planted forest back from west shore of lake. On slopes there ~~[illegible]~~ are thickets and

forests of slender saplings. Some patches of swamp in low spots somewhat away from the lake.

Below Starnberger See is also a large marshy area of glacial outwash.

Extensive Picea forests on road bet. Sternberg + Munich. Forstenrieder Park.

The general pattern of forest distribution on the moraine area has little to do with soil characteristics. Steep slopes are generally in forest. Otherwise it may roughly be a matter of distance from a village. Around a village the closest lands are likely to be cultivated, next in meadow or pasture, farthest away in forest.

1961 Germany

May 21 - Würm River just
north of Starnberg
in deciduous forest on flat
bottom of wide ravine cut in moraine

41795 Asarum
1 common

1 96 Asperula odorata L.
occasional

May 21 - Puppinger Au,
Pupping, 2 km. w. of Wolfratshausen
1 97 Galium boreale L.
rare in low open Pinus sylvestris
forest with juniper and Erica
on calcareous alluvium.

May 21 - above Kochel-See
below Pass to Walchen See
in Fagus forest with Picea and
Acer, on thin soil on dolomite.
1 98 Bellidiastrum
common
1 99 Corallorhiza enata
rare
41800 Melica nutans
1 common
1 01 Carex pilulifera
common
1 02 Carex
occasional

Bavaria

rhizome prostrate, creeping
on surface of ground, with
faint ginger odor; flowers
dull maroon within, trigonous
stems erect, from
yellow prostrate rhizomes;
flowers white; "waldmeister".

erect; flowers white.

rays' white.

pale green, tepals yellowish,
lip white.
glumes deep purple, lemmas
green.

1961 Germany

May 13 - rail trip - Munich - Hannover - Nienburg.

Left Munich 8:15 a.m.

Travelled through a flat plain, in ~~cult~~ meadow and cultivation, locally wooded.

8:35 Dachau

8:37 some low hills, mostly in grain fields, rougher parts wooded. Of fine alluvial material.

8:39 Still rolling hills, some rather extensive patches of Picea plantation, tall and dense. These continue, alternating with large open areas of grain, some meadow, without hedges and with trees only rarely. Occasional villages with trees and streams ~~with~~ lined with bushes and trees.

8:47 Same type of landscape, trees (Quercus, etc.) more common. Some flat valley bottoms seem marshy, or at least somewhat wet.

Hay-making in this area presents some difficulty and the cut grass is draped over frames or

stakes with cross arms to dry. The low wet flat meadows are quite colorful with flowers. The soil in these is very black.

8:53 The amount of forest planting is less, and more confined to rough places and escarpments. The route follows a flat valley bottom with rolling hills on either side. The wet meadows have cattle grazing them but do not appear to be very heavily grazed.

8:57 The amount of forest in the distance is greater. The patches (small) close to the rr. are of Quercus.

8:58 Hop fields interspersed in grain fields on rolling hills. Wires strung on tall poles.

8:59 Fairly extensive area of forest, partly Picea partly low irregular oak. Cytisus in openings and along tracks.

9:00 More hops.

9:01 Extensive marshy plain with some drainage ditches.

9:02 Small Town. Populus planting. (72 km. from Munich)

9:04 flat country as far as visibility in all directions (visibility not too good, thin fog.) ~~S~~

9:05 Same, with some marshes and heathy areas. Oberstimm. Otherwise mostly cultivated.

9:08 Ingolstadt. Left 9:16 Fruit trees very abundant in suburbs. ~~Sa~~

9:18 crossed Danube. Sambucus abundant on rr. embankments and waste spots.

9:22 Flat cultivated plain on left, very ~~slightly~~ rolling slightly higher ground on right. Occasional very small thickets, rows of trees, trees around villages, mainly open. no hedges. Soil very dark brown.

9:28 The land is more rolling, still open and cultivated.

9:31 some Picea plantings, admixture of Quercus and other broad leaf trees.

9:34 Hilliness increasing somewhat.

9:35 Extensive forest, mainly planted Picea, but some birch, ~~and~~ beech, and oak. Country becomes

quite hilly.

9:37 Some beech forest. appears to be dolomite. Flat-bottomed small valleys, cultivated. Hills partly wooded, partly in pasture, locally cultivated.

9:38 Occasional small cliffs. A few pines, some oaks. beech forest more abundant.

9:40 Hilliness decreases somewhat. Proportion of forest decreases.

9:43 Rr. follows a winding valley of a small river, between low cliffs, a ravine cut in a plateau. Then a long tunnel and another similar valley. Cliffs & slopes wooded with beech with admixture of pine spruce and oak. (Possibly the same valley, the rr. avoiding the more extreme meanders by tunnels and cuts. Cliffs are certainly

9:47 Solnhoffen. either dolomite or chalk.

9:48 Some grassy slopes with abundant pine. Bluffs with mixed beech and oak forest. Narrow flat bottom cultivated and meadow. Gentler slopes grassy, with bushes, hedges, etc.

9:50 More and more pine, at least locally.

Some low scrub, probably after clear cutting.

9:51 Bluffs have a mixture of spruce and beech.

9:52 Valley broader, cliffs and bluffs largely give way to gentler slopes, these still partly wooded.

9:54 Treuchtlingen. left at 10:06.

Hills with forest principally of Fagus.

Then rolling locally hilly country with meadows, cultivation, patches of wood on hills. Soil on flat land a dark reddish brown. Hay still being cut by scythe. A few widely scattered trees in the broad valleys, mostly along the stream in bottom.

10:13 Weisenburg

Rolling mostly open landscape. A few thickets of Quercus, Populus etc. and patches of Picea plantation

10:14 more hops, interspersed with grain fields.

10:17 Pine plantings.

Pleinfeld

10:19 extensive pine plantations Soil sandy. Cytisus locally

abundant and in full bloom. Natural reproduction is mostly oak, a little Populus tremuloides and Betula.

10:23 Muhlhausen

Some open cultivated areas, and meadows. Mostly pine woods.

10:24 Open land increasing.

10:25 Georgensmund.

Mosaic of pine and open land.

Continues irregularly to

10:36 Schwabach

10:39 Riechelsdorfer

broad valley surrounded by pine woods

Increasing cultivation, less woods.

10:47 Nürnberg. left. 11 a.m.

Sambucus nigra very common in waste places and on rr. embankments

11:05 Furth.

Orchards around house. Much residence area. Some cult. fields.

Pine forest in distance to left. also in farther distance to right. Generally rolling cultivated land, gray sandy soil. Scattered oaks or oak thickets.

11:08 Open rolling landscape, small patches of pine and oak forest. Much pine in distance.

11:11 Pine plantations on low hills. Valley bottoms in meadow and cultivation

11:12 Some hills also in grain.

Understory of oak in pine plantations, mostly rather sparse, except where pine is thin. Where it is very thick there is little even of herbaceous vegetation under it.

11:16 Pine over most of hilly area.

11:17 Open grain fields on rolling land to rt. pine on left.

Then a small town surrounded by cultivated fields, esp. grain, pine plantations farther away.

Salvia pratensis (?) (dark purple) and *Melandrium* (bright rose) abundant on embankments and roadsides.

11:20 Almost all in pine plantation, Most of these pines are well grown in height, but still of pole size, self pruned.

11:22 Open country around a town. Oak and Crataegus thickets on rough spots. Fruit trees around houses in suburbs.
Neustadt

11:25 Rolling open broad valley Pine on low hills around it.

11:26 Rolling landscape with mosaic of patches of pine in grain fields and meadows light brown soil, apparently sandy. Meadows in low flat areas, yellow with Ranunculus.

11:28 Pine not common except in distance to rt. Low oak forest on low hills to left. Broad valley between with grain fields and meadows. Villages. Some alfalfa.

11:30 Forest patches on both sides mostly oak. Slight admixture of pine.

11:32 Markt Bibart
Broad valley - cult. & meadow. surrounded by oak forest on low hills.

11:35 Mosaic of oak forest and cult. grain fields

11:36 Open rolling land. Calcareous. mostly ~~to~~ grain fields. and alfalfa.

11:37 Higher hills in distance, esp. to rt. and ahead. Tops wooded.

11:40 Iphofen. (photos)
Open rolling cult. landscape. Very little wood.

11:42 Mainbernheim (photo)

11:33 Area of mixed pine, oak, Robinia forest.

11:40 Town – Kitzingen
in open rolling country. crossed large river. apparently Main.? Cult. rolling land. Some small hedges and thickets, but few. A few scattered small oaks. Soil light reddish brown.

11:49 Area of open oak forest with thick under brush of Corylus, etc. Generally rolling open landscape. Thickets more prominent on slightly rougher land. Then open cultivation

11:51 Dettelbach

11:53 Patches of oak forest in open rolling country.

11:55 Jct. (missed name)

11:57 Oak forest on left, grain field on rolling land to rt.

11:59 Open rolling hilly country.

12:10 ~~small city~~. Wurzburg. left. 12:23.
Vineyards on south-facing slopes semiterraced. Staked + wired.
Main Valley – rather steep sides, cultivated, fruit trees abundant, mostly scattered rather than in orchard. Vineyards on rt. even on steeper slopes, but not on bluffs – where rock

is exposed. Top of ridge on left, wooded. Also that on right a bit farther on.

12:35 Interesting looking low cliffs of flat rather thinly bedded shale & conglomerate – possibly calcareous – pale gray.
Bare except for few rock plants.
Apparently limestone, as there is a cement factory.

12:43 Vineyards fewer and ~~not~~ less numerous, slopes brushy.

12:44 Changing to forest – mixed pine + oak on both sides. pure oak on left. Grain fields + meadows in bottom of valley.

12:50 Gemuenden. Both side of valley steep, wooded with oak.
Considerable barge traffic on Main.
Left at 1:00 p.m.

1:02 Left Main up small valley between hills ~~thickly~~ planted to Picea, then on rt. thick oak ~~woods~~. forest, patches of pine. Then same on left, then gentler slopes with grain fields. oak forests a ~~short~~ little way back on left, immediately on rt. on steep slope.

1:06 Cultivation, with hedges on both sides.
Tunnel

1:10 Thick forest on both
side, irregularly
mixed, oak, pine beech spruce
Then an area of cultivation
on the gentler slopes.
Then pine forest on rt
pine & beach on left, patchy.
Some patches of cult.
on rt. Then open slopes
1:14 on left and right.
1:17 More thick mixed forest.
Tunnel.
Mixed forest on rt + left.
Steep wooded slopes.
Gentler cult. slope.
Hedges. Reddish sandstone.

1:20 Slopes cult. semiterraced
with hedges. Wooded above.
1:25 Both sides of valley
wooded. Beach with pine
Then lower slopes cult.
Hedges fairly general
semiterracing.
Dryopteris filixmas common.
1:28 Climbing on side. Village
with fine ruined castle
on other side of valley.
Valley broad, cultivated,
ridge tops only wooded.
Crataegus hedges.
Long tunnel ~~Sterbfritz Tunnel~~.
1:32 Sterbfritz.
High rolling grain fields.

Pine woods on hill tops.
also beech + spruce - mosaic.
Fruit trees along roads.
1:35 Ramholtz Tunnel.
Soil distinctly reddish.
1:37 Proportion of forest high on
hilly ground. Mixed
deciduous, Robinia on cuts.
Some patches of spruce and
pine. Mostly oak with
admixture of other things.
Some areas of beech, some ash.
1:40 Brandenstein Tunnel.
Beech forest on rt. Open valley
on left.
1:42 Then hilly country with
beech forest. Valleys grassy
1:43 Open hills on left, some thickets
Beech woods on rt. some planted
Picea. Beech on limestone.
Crataegus hedges in grassy
country. Oak woods on
rough places. Scattered
oaks in fields, also
fruit trees.
1:47 Picea woods, some oak and
beech admixture, some
beech forest.
1:49 More red sandstone & shale.
Oak woods.
1:50 Rolling hilly country meadows
grain fields, patches of woods
hedges.
1:54 Flieden. In plain is an

enormous conical pile of white material; probably a mine dump. This on left.

1:57 Neuhof.
Large forests in distance on both sides. Then much closer. Large patches. Some oak. Mostly coniferous. both spruce + pine.
Flatter areas in grain and
2:01 meadow. Hills in spruce forest
Flattest parts are wet meadow.
2:02 Bronnzell.
Landscape flattens out.
2:05 Fulda. left 2:10
Open country with scattered wooded hills. Some hedges of Prunus + Crataegus. (3 photos)
2:17 Götzenhalt (2 photos)
Many small villages in rolling plateau.
Pine plantations on surrounding low hills. also some beech and birch forests. Some mixtures.
2:2[illegible] Some spruce with a little pine. Then pine, and oak. + mixed oak + beech. all on rt.
Open wide valley on left. Woods on ridge in distance.
2:24 Wide rolling open country. a few trees and hedges very locally.
2:30 Flat narrow valley with

wooded hills, mixed pine and oak, some beech, locally planted Picea.
2:33 Forest principally beech on rt., Picea on left. Then pine and beech on rt. Open rolling grain fields on left.
2:34 Pine wood on hills to rt.
2:35 Neukirchen. Open valley with meadows and grain fields. Patches of oak wood. Salix along streams. Flat valley bottoms are flowering meadows.
2:38 Hills with oak forests, some mixture of pine.
Then another winding valley, lower or more gentle slopes in cultivation, bottoms in meadow, willows along stream ravines, some forest on hilltops.
2:42 Bad Hersfeld. Oak forest on some hills, some admixture of beech. Some others with planted pine and spruce.
2:44 Valley narrows. Hills rounded, almost entirely forested. with mixed coniferous and deciduous forest.
2:45 Mixture of wooded hills and cultivated valleys + slopes.

Wide flat valley with meadows, grain fields, surrounded by wooded hills.

2:50 Bebra. left. 3:01 took left fork. toward Kassel, — no it looped back to right and crossed the other fork. Apparently we are going via Göttingen. Vast open valley around Bebra. Climbed slope above the town. Slopes are all covered with grain fields. R.R. cut wooded with Robinia. Dryopteris filix-mas abundant beneath. upward patches of forest become frequent, mostly planted Picea. Thickets and hedges of Crataegus, oak, Robinia, Salix. Small patches of a cotton-like plant. Steep escarpments have

3:13 oak woods. Patches of oak wood mixed some with pine & beech.

3:14 Tunnel.

Then mosaic of grain fields and forest, this locally oak, beech, or coniferous, or mixed.

3:18 Climbing, still.

3:20 Tunnel

Mixed spruce, pine, beech, oak

forest. Then cultivated hills, oak forest locally and mixed thickets in rough places.

3:23 Extensive rolling cultivated land. Pastures with scattered trees and shrubs on steeper slopes. Trees mostly pine and fruit trees.

3:25 Broad valley with gentle slopes, light pinkish red soil, semiterraces in many places. ~~Some~~

3:30 Wooded hills and steep slopes, oak and pine, separately or mixed, cult. valleys between them.

3:33 Then open rolling valleys and hills, few trees except fruit trees occasional short hedges, oak on escarpments, willow along streams in flat

3:34 valley bottoms. High hills in the distance forward to the right. Harz Mts.??

3:37 Valley narrows, and steep hills and small mountains close it in, densely wooded with a patchy mosaic of broadleaf and coniferous forest. Fairly large stream or small river meanders in bottom of valley, which is cultivated. Robinia locally along r. Some orchards among fields.

3:43 Bad-Sooden. wide flat place in valley. Werra River.
Slopes on left abrupt, dense oak woods. On rt. gentle and cultivated in lower parts, dense forest, prob. oak, above. Occasional patches of conifers.

3:46 Valley narrows again, steeper slopes forested.

3:48 Crossed Werra.
~~Castle~~ church on hill to ~~rt.~~ left. (Ludwigstein?)

3:49 Left Werra, into hills to rt. Hills partly cultivated, partly, esp. steeper slopes, forested.

3:54 tunnel.
Hills, densely forested with beech and pine. - oak on sunny slopes.

3:57 Eichenberg
Broad cultivated valley with villages. grain and pea fields. Some hedges (Crataegus) wooded knobs, mostly oak woods. Willows along streams. Orchards on flat ground. meadows on low-lying flat ground.

4:05 Hills become lower. Less wooded. Obernjesa.

4:06 Valley widens into an extensive plain, hills in distance on either side. A city on right at base of hill and on lower slopes.

4:07 Gottingen left 4:16.
Broad flat valley, river terraces. Leine River. Valley all cultivated, mostly grain fields. Hills on both sides forested.

4:24 Broad flat valley still, densely forested ridges on both sides. Barley fields. Trees around villages. and some along roads.

4:30 Northeim. left 4:34.
Still the same broad very flat valley, intensively cultivated.

4:41 Patch of pine and of beech forest on low hill to rt. Otherwise grain fields.

4:44 Valley narrows between rounded hills, wooded in places with beech, spruce, oak, some pine. Higher hills mainly with beech forest. Hills seem chalky.

4:48 Kreiensen. left 4:51.
Flat valley with wooded ridges on either side, mostly beech. grain fields and meadows in valley and on lower slopes.

5:00 Freden. Waste places with much Sambucus nigra.

Valley narrows somewhat
5:01 (crossed Leine R.) but bottom stays very flat. Rounded hills on sides mostly have rather abrupt, densely forested slopes. Rarely cleared and cultivated, where more gentle. Flat bottom mostly meadow. Soil a gray brown, apparently rather sandy, with rather high water table. Small towns ~~[illegible]~~. occasional.

5:06 Alfeld.

Valley widens somewhat. Hills still densely wooded above, with lower slopes cultivated

5:12 Valley much wider, some miles, bottom flat, but with a couple of river terraces.

5:16 Phragmites in drainage ditches.

5:17 Elze. left 5:19

Relief in valley bottom somewhat greater. Flat bottom less extensive. Broad grain fields. Some ponds and marshes. Willows around these and along river.

5:23 A low dome-shaped wooded hill on either side. A castle,

Marienburg, on the one on left.

5:26 Nordstemmen

~~A couple of [illegible]~~

Several similar but even lower hills in distance. Otherwise the country is now a vast perfectly flat plain. Judging by the ponds, the water table can't be more than a few dm. below the surface. Some slight undulations a short distance ~~to~~ on either side. Grain fields, small orchard, thickets, willows along watercourses, abundant marsh plants in ditches, ponds, and along streams, rows of trees, esp. along roads, some wet meadows, but most of area intensively cultivated.

6:08 Fruit trees very abundant in residence areas south of Hannover.

6:14 Hannover. lv. 6:18.

6:24 second start.

Suburbs are in places really like an orchard with houses among the trees. A fine patch of mixed broadleaf forest, prob. a park. Then horrible industrial area. Then gardens. small shacks, edge of town.

6:30 Housing development -
ugly barracks, but with
areas set aside for gardens,
fruit trees, etc. Beyond this
residences with much
garden land.
Then open flat land -
Some thickets, more gardens.
Wood along watercourse.

6:34 A town, Seelze, with
more gardens and fruit
trees.
Forest across river to left.
Almost continuous gardens.
many houses.

6:36 Residences thin out some.
Patch of oak forest on rt.
then on both sides.

6:37 Then open fields.
Small pine wood on rt.
some oak & willow also.
Pine on left with understory
of oak.
Open fields.

6:40 Fork to rt. Open fields with
rows of trees along canals.
Blue lupines along embankment.

6:42 Low sand hill with
scattered pine, then
irregular mixed forest,
mostly oak.

6:44 More patches of forest,
mostly oak, open and
irregular. Few cultivated land.

mostly open. Scattered
villages, rows of
houses.

6:46 Extensive very flat open
grain fields. Patches of
forest in distance.
Villages and farms.

6:47 Woods on left. Patches of
pine on right. Picea, young,
among pine.
Mixed woods on left.

6:48 Land becomes very slightly
rolling. Scattered
patches of woods.

6:50 Flat open land, forest
visible in all directions.

6:52 Land somewhat rolling,
many patches of pine.
Some oak. Scattered
Salix and oaks in low
flat areas.
Mixed thickets. Some
grain fields, some very
young pine plantings.
Thin black soil underlain
by yellow sand.

6:55 Low young mixed forest for
some distance, then
openings, more forest.
Now tall oaks, then
mixed with pine.

6:56 Birch forest, then pine,
various mixtures. Meadow.
Patchwork - cultivation, meadow, forest.

7:00 Nienburg

1961 Germany

Tuxen's laboratory. —

They have made, in all, over 800 maps, most of which have not been published.

Always a basic map based on plant associations. Then various derived maps — of water levels, of soil moisture, of forest and agricultural potential, of kinds of trees and crops that should and should not be planted, etc. These must depend on a great amount of correlation and experience.

Most spectacular thing in institute is collection of soil profiles.

Method of making them is to dig a pit, smooth off the desired profile. Then spray it with a laquer dissolved in acetone. Allow acetone to evaporate. Then glue a cloth to this surface. Then cut away the layer of soil next to the cloth. Bring it in to lab. Lay it out on a masonite sheet, glue it down. Then shave it down to as thin as possible while still preserving the features. Dry thoroughly. Then wash well with acetone, which brings

out the color of moist profile. Frame and cover with cellulose acetate film well away from surface.

Tüxen illustrates some late Pleistocene and Post-Pleistocene history with these that is most remarkable. Also some vegetation — soil relations, roles of vegetation in profile formation, also vegetation - soil - primitive man relations.

kind of laquer and glue?

Ruth - Temperol - Werke
Hamburg - Wandsbek
Walddörferstr. 136

Plain of the Weser consists of a terrace and a flood plain. The terrace is of sand. nat. veg. is ~~Querco-~~ Fago-quercetum ~~Betuletum~~. Flood plain, of reddish loam deposited about 1000 years ago when upper valley 150 km. or so up was deforested and eroded. natural veg. Fraxino-Ulmetum. Presently cultivated completely. Characteristic landscape of hedges of Crataegus, Prunus spinosus, Sambucus, etc. and scattered large Fraxinus excelsior. Within last years these, esp. the hedges have been almost eliminated to increase land for cultivation.

red villages ↗
potatoes
rye

sugar beet,
Barley
wheat
meadows.

May 24 — n.e. of Nienburg
on sandy moraine are
dense plantations of pine
and Calluna heaths. Podsols.
Querceto-Betuletum nat. veg.
On less sandy soils the
nat. veg. is Fago-quercetum -
now entirely cultivated.
Glashof - 2 photos of houses
Typical architecture.
On richer soils pH 6-6.5
Querceto-carpinetum, on
terrace of ~~[illegible] R. Aller~~ R. Leine
but mostly Fago-quercetum

On sandy soils the landscape
is a mosaic of blocks of
pine plantation separated by
smaller areas of cultivation
"kulissen landschaft". This
is to protect the open areas
against wind erosion.

On the Aller flood plain
are areas of Alnetum Betuletum
and some pure stands of
Myrica gale. Wet areas. Myrica
favored by fire. Permanently
wet from high ground water table.
Fraxino-Ulmetum wet from
inundation.

Autobahn to Hamburg -
the grass-cover on roadsides
and also the tree planting
done according to a
phytosociological map.
Resulted in far more
successful stabilization
of sand and better growth
of trees.

Correlation of associations
with soils result of thousands
of observations, with ground
water levels result of
hundreds of observations.

Querceto-Betuletum landscape
on moraine dominated by
Pinus sylvestris plantations
with, where not cut out,
understory of Betula and
Quercus. Areas of Calluna
and of planted? Cytisus scoparius. ~~and~~
Festuca ovina planted on ~~[illegible]~~
shoulders of highway.
This is a strongly podzolized
~~sand~~ soil.

Toward perhaps older. Hamburg change in
landscape - relief greater, soil
brown. pure Fagus forests also with oak.
This moraine is a bit younger.
Soil not quite so poor.
Much less birch.

Approaching Hamburg –
a vast alluvial plain of Elbe
Peaty soil – Alnetum.
Salix alba common.
This on the outer parts
near moraine – wetter and
more humus.
Near river drier, less
humus. Fraxineto-Ulmetum.
Salix forest along
river. Phragmites marsh
Tides 1 m. or more.
The Fraxinetum slightly
higher than Alnetum.

Beyond Hamburg – first
the middle moraines with
Fago-Quercetum. Then an
older moraine landscape
rolling, lacking forest,
fields separated by Crataegus-
Corylus hedges. Rotation on a 7 year
cycle bet. grass and crops.
Hedges cut back when crops
are grown, allowed to grow up
during grass period, for protection
and to serve as fences.
Still Fago-Quercetum.
– also Querceto-Carpinetum

Hedges become largely
Corylus toward Kiel. All these
hedges have a low earth wall
at base; deliberately built and
repaired every 7 years.

The relief is, in general,
inversely related to the
age of the moraine. The
fertility also. But much
local variation in fertility
esp. in young moraines.
Differences gradually
smoothed out.
In young moraines there
are many ponds and bogs.
Few in old moraines, as
they have been filled in during
the long period of erosion
as the terrain has been flattened.
Hedges on young moraines are
dominantly Corylus.
Fraxinus indicates a rich soil.
In young moraines one
sees characteristically over
the hedges into the fields,
because of the relief. In old
moraines the fields are
hidden by the hedges.

May 25 – Schleswig – Tiergarten
A beech forest with
admixture of Picea (planted)
Geranium phaeum –
Rubus spectabilis?

Some Quercus, Carpinus, Tilia

Roadside
Geranium robertianum
Carex
Urtica dioica
Tilia platyphyllos
Vicia
Galium aparine
Taraxacum ~~off~~ vulgare
Rumex crispus?
Melica uniflora

In woods
Asperula odorata
Maianthemum bifolium
Veronica
Luzula pilosa
Athyrium filix-femina
Stellaria (large fl.)
Anemone nemorosa
Carex sylvatica
Fagus sylvatica (incl. abundant seedlings)
Fraxinus excelsior
Milium effusum

"Forstkultur" = forstliche Bezugsgenossenschaft Frankfurt/Main, "Bodenbohrstock, 1m lang

Dr Siegfried Zingel, Reinbek bei

"Forstkultur" - forstliche Bezugsgenossenschaft
Frankfurt/Main, Bodenbohrstock, 1 m lang

Dr. Siegfried Zingel, Reinbek bei Hamburg.
Bundesforschungsanstalt für Forst- und Holzwirtschaft,
Abteilung Forstschutz

n(2) Carpinus Viola sylvatica
n(1) Fraxinus Epilobium montanum

"Forstkultur" - forstliche Bezugsgenossenschaft
Frankfurt/Main, Bodenbohrstock, 1 m lang

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Roadside
Geranium robertianum
Carex
Urtica dioica
Tilia platyphyllos
Vicia
Galium aparine
Taraxacum ~~off~~ vulgare
Rumex crispus?
Melica uniflora

In wood
Asperula odorata
Maianthemum bifolium
Veronica
Luzula pilosa
Athyrium filix-femina
Stellaria (large fl.)
Anemone nemorosa
Carex sylvatica
Fagus sylvatica (incl. abundant seedlings)
Fraxinus excelsior
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Soil profile taken with this instrument was sandy, light brown, somewhat grayish in upper few centimeters, not well differentiated into horizons.

A pit dug in a flat area of open beech-oak mixture- light-yellowish brown.
(Trees almost 30 m.)
About 60-70% Fagus, 30-40% oak.
No shrubs ex saplings of Fagus, Rubus (very few)
herbs-.
a Milium effusum ~~Lu~~ Luzula pilosa
c Stellaria holostea
c Carex sylvatica
c Asperula odorata
c Geranium robertianum
c Circaea lutetiana?
la Oxalis acetosella
la Anemone nemorosa
l Rubus idaeus?
l Veronica montana + V. chamaedrys
c Ranunculus ficaria
r Lamium (yellow) galeobdolon
l Melica uniflora
a Festuca sylvatica
r(s) Carpinus Viola sylvatica
r(s) Fraxinus Epilobium montanum

The shrub layer here was removed in a year when beech fruited abundantly the ground was plowed, and now there is a great crop of beech seedlings.

Soil profile

yellow brown, top few cm. darkened somewhat,

lower part mottled with gray and darker brown. (below 3-4 dm.)

somewhat sandy clay in upper few inches, stiff clay below.

a brown earth pseudogley. (mottled from high soil moisture "stauwasser" not ground water)

Another pit, in same forest, 150 m. away, in a peaty area.

Upper 4 dm. a dark brown mottled with ashy gray fine sand,

dark part mostly peat but with some fine sand - Leucobryum on surface

Below this a fine sand with some clay, mottled red brown, yellow brown, and gray.

Sharply distinct from A horizon. Some iron concretions apparently the beginning of an ortstein layer. or an old one broken down.

From map by ~~Prof. Raabe~~ H. L. Heck

The eastern half of Schleswig-Holstein seems to be young moraine, the western half older and alluvium & maritime marsh. Division about the long axis of the isthmus.

May 26 - trip by bus - Schleswig to Flensburg & Glucksburg.

Wet marshy meadows along south shore of Schlie across from Schleswig.

Moraine - rounded hills a few m. relief. Hedges of Corylus, Crataegus and various other shrubs and trees, cut the landscape into small fields of 1 - several acres. No forest but one or two fields seen newly planted to Picea.

Güby = some patches of forest - Picea, some admixture of broadleaf trees, esp. around margins. Only locally.

Holm,

New hedges are 1 species. Old ones, to 200 years, up to a dozen species of shrubs.

Bültsee - stop.

small lake surrounded by marsh of Carex stricta with fringe of Scirpus lacustris

1961 Germany

May 25 - Schleswig

41803 Carex arenaria
on sand bank, edge of Schlei

— ~~in~~ forest of Fagus and Quercus
on moraine.

1 04 Veronica montana
in edge of thick

1 05 Veronica montana
in soil plowed earlier in

1 06 Veronica chamaedrys
in soil plowed earlier in

1 07 Luzula pilulifera
common on soil plowed earlier in

1 08 Stellaria holostea
very common on soil plowed earlier in

Schleswig

branches ascending

flowers bluish violet

flowers bluish violet

small tufts, culms spreading-
— ascending.

prostrate with ascending
branches, petals white.

on margin of water. also Phragmites
Shrubs of Salix sp. scattered
irregularly. Carex rostrata, als
Sod around margin of
10 m. Juncus balticus. Luzula campestris
Anthoxanthum odoratum, Cepis:

Marsh is discontinuous
Scirpus has come in very
recently with increasing
eutrophy. Ranunculus celeratus
2 swans.

12 m. Up slope very slightly a
dry meadows
Aira caryophylla
" praecox
Festuca ovina vulgaris
Hieracium pilosella
Ornithopus perpusillus
Vicia angustifolium
Cerastium semidecandum
" arvense
" caespitosum
Rumex acetosella
Polytrichum juniperinum
Hypochaeris sp
Luzula campestris
anthoxanthum odoratum

Beyond here - occasional
Irissunde
Very narrow point in Schlie
Phragmites marshes, but very
small. Bluffs about 5 m. high

of sandy morainal material
Archangelica officinalis
Anthriscus silvestris
~~Scirpus paluster~~
Cirsium arvense Triglochin maritima
Carex otrubae gr. vulpina
Convolvulus sepium Cochlearia officinalis

Phragmites zone
Scirpus maritimus zone
Carex otrubae zone
Archangelica zone

The anthriscus is only
shoreward, becomes dominant
above the Archangelica.
Archangelica ~~zone~~ area is somewhat
nitrophilous

On wooded bluff anthriscus,
Rosa sp. Alliaria, Urtica,
Artemisia, Dactylis. Lamium album,
trees & shrubs are
Fraxinus, Corylus, Populus,
Crataegus, Sambucus, Quercus
Euonymus, Prunus spinosa

Grassy bluff
Vicia angustifolia
Hieracium pilosella
Trifolium procumbens
~~Trifolium~~ procumbens
Saxifraga granulata
Centaurea scabiosa
Ononis repens

Dactylis glomerata
Festuca ovina
Plantago lanceolata
Arenaria serpyllifolia v. viscida
Vicia lathyroides
Aira caryophyllea
Pimpinella saxifrag
Hypericum perforatum
Thymus pulegioides
Myosotis hispida
Vicia hirsuta
Arrhenatherum elatius

Crossed on small ferry

Kösel.

Sandy moraines.

Patch of beech woods.

Larger fields.

Noor - arm of Schlei

Phragmites forms a floating mat, pulled loose by ice in winter.

Cytisus scoparius common locally along road.

Norby - windmill much like those in Holland.

Riesby.

Local name for hedge - knick because the shrubs are broken or knicked every 7 years.

A small beech wood. several such patches

to be seen in middle distance.

Houses brick with thatch.

Marl pits were common. but now mostly filled.

Riesby

Patches of wood very sparsely scattered.

Cultivation of barley, wheat, sugar beets. Meadows.

Marl pits filled with water, surrounded by bushes.

Many more are marked on 1/25,000 map than are now evident.

Winnemark.

In hedges Corylus, Syringa, Salix 2 spp., Crataegus, Sambucus, Prunus spinosa Rosa Euonymus, Quercus, Salix caprea, S. purpurea ??

Schwonsburg 15 ppt. salt or less.

Marshes of Phragmites (photos. fringing water.

Juncus maritimus (photos) with Armeria. hummocky from grazing. Aster tripolium.

Festuca rubra, Juncus gerardii Plantago maritima, Plantago coronopus, Sagina maritima Agrostis stolonifera, form a dense sod. Glaux

Armeria maritima

Kappel. crossed Schlei.

Fish weirs in narrow part of Schlei. Herring which are smoked here.

Patch of beech wood back of town. Mostly small fields and gardens. Fruit trees just out of town around houses. Several patches of forest: Melico-Fagetum.

Cows are all dark red. Local breed.

Patches of rape in full flower. A very little rye. Mostly barley, wheat and meadow. oats.

wheat, rye, one form of barley sown in fall. Oats & one form of barley in spring.

Gelting

Flensburger Förde on rt. Coasts low.

Aesculus hippocastanum is a common planted tree near houses.

Patchwork of fields and hedges on gently rolling ground. Fraxinus common.

Steinbergkirche
Relief very slight, but still a young moraine.
Fields rather large.

turned right ~~at~~ before Nübeck.

past Roikier is a patch of beech forest. Holsthoppel near [illegible]

Tall dense forest, with oak, ash, Carpinus

Where cutting has been done on edges, much reproduction of beech.

There is no shrub layer in dense part of forest. Canopy almost complete, about 25 m.

Trees to 5 dm. dbh. spaced 2-5 or 6 m.

la Melica uniflora
a Asperula odorata
? Ranunculus ficaria
c Impatiens noli-tangere
a Anemone nemorosa
l Stellaria holostea
c Viola silvatica
c Milium effusum
c Veronica montana
l Carex silvestris
r Neottia nidus avis
c Geranium robertianum
la Oxalis acetosella
l ~~Stellaria~~ Moehringia trinervia
c Ranunculus lanuginosa
o Sanicula europea
o Circaea lutetiana
r Epilobium montanum

r Dryopteris filix ma
l Primula elatior
a Stellaria nemorum ssp montana
o Primula acaulis
r ~~Stellaria nemorum~~
l.c Stachys silvatica
r Stellaria nemorum ssp. glochidosperma

Two associations are represented here. Melico-Fagetum and Querceto-Carpinetum

Neukirchen

No finch seen so far today
Laburnum occ. planted as ornamental.
Kalleby
Tulips still in flower.
Windmill - formerly much more numerous to grind grain.
Beyond Nübel some hedges have been replaced by fences of barbed wire.
Dollerup.
All cows are dark red.
Turned off b.wy. to it.

Westerholtz
Langballigau
Coastal terrace
Pebbly beach with
Arenaria peploides
Cirsium

Festuca rubra
Taraxacum vulgare
Atriplex latifolia
Potentilla anserina
Achillea millefolium
Elymus arenarius
Tanacetum
Petasites

Slight beach ridge
back of it marshy meadows.
Alopecurus geniculatus
Potentilla anserina
Poa pratensis pumilis
Triglochin maritima
Festuca rubra
Triglochin palustris
Carex otrubae
Carex distans
Trifolium fragiferum
Glaux maritima
windrows of dried Fucus + Zostera on beach.
Near edge of woods C. disticha
C. fusca
patches of Carex panicea
with Caltha C. acutiformis
Ranunculus acer
Myosotis caespitosa
Senecio aquaticus
Trifolium pratense repens
Anthoxanthum odoratum
~~Dianthus~~
Bromus ~~[illegible]~~ racemosus.
Eleocharis uniglumis
Taraxacum sp.
Lychnis flos-cuculi

Depression a ditch
with Eriophorum

Acerto-Fraxinetum
Wood of Acer ~~platanoides~~ pseudoplatanus
Fraxinus excelsior
Fagus   Alnus glutinosa
Sambucus
Prunus spinosus
with
Equisetum pratense
Urtica dioica
Stellaria nemorum
Asperula odorata

other steep slope   Fago-quercetum or (Trientalis Fagetum)
with Populus tremula
Sorbus aucuparia
Quercus no Betula

Vaccinium myrtillus
Maianthemum
Luzula sp.
Anemone nemoralis
Deschampsia flexuosa
Trientalis
Lonicera periclymenum
Solidago virgaurea

Wet meadows are
Bromion racemosae. (alliance)
apparently on peat or
muck, as the ground
trembles under foot. yes. acc. Tüxen.
Many species.
Scattered alders. If these
meadows are not mown
Alnus will soon dominate.
(photos and soil)

Landballigholz
Fairly level rolling moraine.
Toward Glucksburg the
relief becomes greater.
Ulstrup

Glucksburg - (stop)
Harbor lined with
Phragmites.

Beech forest with
some oak maple,
Abundant saplings of
Acer 1-2 m, forming shrub
layer. quite patchy, absent in large areas.
Herb layer of beech seedlings
la Anemone nemorosa
r Melica uniflora
r Asperula odorata
l Stellaria holostea
l Stellaria nemorum
lo Milium effusum
la Mercurialis perennis
~~lo Trientalis europaea~~, l Luzula maxima

Where there is a hole in canopy shrub layer is 3-4 m

✓ ld Luzula maxima
✓ r Melampyrum pratense
✓ la Deschampsia flexuosa
✓ la Sorbus aucuparia (near edges)
✓ la Maianthemum bifolium
✓ ·c Trientalis europea

2 associations or subassociations acid one plants marked ✓ rather sharply distinct.

Anemone slightly mixed in patches of Deschampsia and Luzula.

✓ l Lonicera periclymenum
✓ la Vaccinium myrtillus

Over a considerable area Luzula maxima is completely dominant in the ~~veget~~ ground layer no shrubs. Canopy somewhat broken. A layer of 1 dm of loose dry duff, Then a dark humus filled gray sand.

Luzulo-Fagion.

Soil pit shows a thin black layer, +- 10 cm. (under the duff root layer) Then 20-70 cm. gray sand. Then a dark brown mottled layer fading quickly into a mottled yellow and gray sand-

in the dark brown layer is some (incipient) ortstein, locally somewhat hard. This layer varies greatly in thickness and color over in the one pit. being from 15 cm to 50 cm.

The entire profile is fine sand, with a few pebbles of flint.

Beach of ~~[illegible]~~ sand mixed with shells and pebbles much of it has no vegetation Fucus and Ulva thrown up in a ~~[illegible]~~ drift line.

Locally patches of
~~E~~ Elymus arenaria
Arenaria peploides
r. Taraxacum sp.
Agropyron repens
Festuca arundinacea
Potentilla anserina
Festuca rubra
Rumex crispus
Calamagrostis epigaeus

planted patches of Rosa rugosa - dense, low. 3-4 dm high. locally covers beach flat completely. Flowers very large, a beautiful deep rose color.

Murwig
Flensburg

Leaving Flensburg the road follows the edge of the young moraine. On the left is the hilly land of the younger moraine, on the right, and then on both sides is the flat land of the old moraine. Brown soil on young moraine, violet on old moraine. Pine and spruce plantings. Mostly open fields and meadows with hedges, a few patches of woods.

Terminal moraines and very flat outwash plains from them - young morain.

Some small dunes on outwash plain.

Rye and meadows.

Some small ponds and plantings of Larix.

1961 Germany Schleswig

May 24 - Langballigholz,
3 km. e. of Glucksberg

1	41809	Ulmus scabra ~~on~~ steep wooded slope on morainal gravel.	small tree.
1	10	Bromus mollis common in edges of wet meadow	
2	11	Bromus racemosus abundant in wet meadow	
2	12	Luzula maxima (a sylvatica) common in acid woods on slope	
1	13	Equisetum hyemale very local in acid woods on slope	
1	14	Vaccinium myrtillus common locally in acid woods on slope	dwarf shrub; fruit immature.
1	15	Polypodium vulgare L. rare on sandy slope in acid woods	
2	16	Luzula pilulifera common on sandy slope in acid woods	
1	17	Maianthemum bifolium abundant locally in acid woods	flowers white
1	18	Luzula campestris common on open eroded slope	
2	19	Equisetum pratense abundant in rich woods	
1	20	Mohringia Mohringia local in rich woods	flowers white.
1	21	Myosotis caespitosa rare in wet meadow	flowers blue
1	22	Salix cinerea common on edge of forest and wet meadow	shrub 3-4 m tall, leaves bluish green.
1	23	Carex distans common in wet meadow in dense sod	
1	24	Poa pratensis var. humilis abundant in dense sod in wet meadow	

1961 Germany Schleswig

1 41825 Triglochin palustris
occasional in wet meadow in dense sod.

2 26 Juncus gerardi
abundant in dense sod in wet meadow

1 27 Alopecurus geniculata
abundant in dense sod in wet meadow

May 26 - Gluecksberg

1 28 Trientalis europaeus
common in beech forest
~~[illegible]~~ rhizomes thread-like, white; flowers white.

May 26 - Horstkoppel, near Neukirchen
in dense beech ~~[illegible]~~ forest

2 29 Stellaria nemorum var. ~~[illegible]~~ montana?
local
flowers white.

1 30 Carex sylvatica
common

2 31 Sanicula europaea
rare
flowers white.

1 32 Ranunculus lanuginosus
common
flowers bright yellow

1 33 Milium effusum
common
erect

1 34 Anemone nemorosa
abundant
rhizome brittle; dark brown except white tip.

1 35 Viola montana
common

1 36 Melica uniflora
local

2 37 Moehringia trinervia
~~local~~
diffuse; flowers white.

~~##~~ 1961 Germany

May 26 - Missunde,
on Schlie Förde

41838 Carex otrubae
1 common in marsh on edge of ~~fjord~~
1 39 Myosotis hispida
occasional, local

May 26 - Bültsee

in rather dry sloping meadow,
rather open

2 40 Festuca ~~rubra~~ ovina v. vulgare
abundant

1 41 Ornithopus perpusillus
occasional

1 42 Aira caryophyllacea
very common

1 43 Aira praecox
common in bare spaces
between tufts of other species.

2 44 Luzula campestris
very common in dense sod
at foot of slope

1 45 Ranunculus celeratus
same - in edge of marsh

same - roadside ditch

1 46 Saxifraga granulata
common

Schleswig

flowers minute, blue.

prostrate

erect, flowers white;
bulblets ~~on th~~ at base of
plant pinkish.

1961 Germany

May 27 - bus trip Schleswig - Husum, north, back to Schleswig.

Left the terminal young moraine just west of Schleswig. On flat outwash plain birch is common, Picea is planted, soils are violet, as on old moraine Populus tremula appears.

Schuby.

Hedges have no Syringa, not much Corylus.

Landscape has become very flat

Cultivation principally rye and potatoes.

Practically no forest except in the far distance.

Hedges have no Corylus.

Silberstedt.

Natural vegetation is Fago-Quercetum.

Silberstedt Forst.

Fagus-Quercus rather natural forest, much opened up and irregular. some Carpinus

Shrub layer

Rhamnus frangula
Quercus
Sorbus aucuparia
planted Picea,
Rubus sp.

Herb layer: ∘ Anthoxanthum odoratum
c-∘ Pteridium aquilinum
Lonicera periclymenum
Stellaria holostea
Melampyrum
Deschampsia flexuosa
Trientalis europaea
Luzula pilulifera
Cornus suecica
Maianthemum bifolium
Vaccinium myrtillus
Dryopteris spinulosa
~~Mil~~ Milium effusum
Dryopteris "spinulosa"
Oxalis acetosella

The Cornus suecica forms a dense colony occupying an area a few m square. (photo)

Soil profile:

4 dm. very dark brown, peaty.

below this a dark mottled gray, yellow, dark brown, & red brown, down to the water table.

Evidently an old Calluna profile.

Nearby in a low wet place there is a profile of perhaps 25 cm. of blackish peaty sand and gray mottled with yellow sand and gravel beneath it.

Forest here beech, alder,

Shrub layer
Quercus
Fraxinus
Carpinus
Crataegus
Corylus
Herbs
Carex silvatica
Ranunculus sp.
Viola sp.
Anemone nemorosa
Geum
Carex sp.
Sanicula europaea
Mercurialis perennis

A black pond with no aquatic veg. nearby.

Treia

Polypodium vulgare common in this region on sand, on north slopes, also on trees.

Hedges of Prunus spinosa, Sambucus, Crataegus, Salix, Sorbus suecica, Alnus, Quercus

Schwesing
Anthriscus common here in old moraine, almost absent in outwash plain.

~~[illegible]~~
Husum. to n.e. to Engelsburg.
Along this road Sorbus suecica is the street tree.

Area of oak scrub about 3-4 m. tall, dense, on sand. Some Rhamnus, Populus, Crataegus, Lonicera ~~sp.~~ pericl- Sorbus aucuparia, Rhamnus. Coppiced every 5-6 years. Fagus has been eliminated by cutting.
Herb layer la. Convallaria majalis
a Anemone nemorosum
c Polygonatum multiflorum
a sterile grass Holcus mollis
c Pteridium aquilinum
la Luzula
lc Stellaria holostea
lc Anthoxanthum odoratum
l Teucrium
la Maianthemum bifolium
Open Calluna heath with planted Larix, Picea, etc. Some very small Populus tren. Lupinus sp. Luzula pilulifera Anthoxanthum. Juncus ~~sp~~ squarrosus Deschampsia

Soil profile in oak scrub
25-35 cm. of pale gray sand,
lower margin very irregular
(appearing scalloped).
Immediately below this several
cm. darkened, dark brown, fading
at once to a dark yellow brown
sand which becomes paler
and mottled downward
mottling is dark red-brown
to blackish. Black fine
bits, very irregular.
May be incipient ortstein.
Entire profile fine sand.

Husum

north of city a large polder
enclosed by a dyke - 400 years old.
north of this very low
photos land, fringing the old moraine
Gentle slope down to ~~marsh~~ beach
divided by low earth walls
with 2 low barbed wire fences
photo slanting in opposite directions
On walls are: Carex arenaria,
Elymus arenarius, Festuca rubra,
Rumex acetosella, Cerastium sp.
Taraxacum, Hieracium pilosella,

Meadows between them
have a firm sod, with
much Ranunculus, locally
Juncus. Much Bellis.

Beyond beach, low walls
of poles and wattle run out
in shallow water for reclamation.
These serve as baffles,
standing the strong ebb
which would carry out the silt.

sod ~~[illegible]~~ on mud in reclamation areas
Agrostis stolonifera
Scirpus maritimus
Aster tripolium
Puccinellia
Plantago maritima
Triglochin maritima
Festuca rubra
Glaux maritima
Suaeda
Salicornia

Beach
Honckenya maritima
Carex arenaria
Elymus arenarius

The Scirpus maritimus
and Salicornia bring about
settling and retention of silt.
Then this is shoveled up in
levees between parallel ditches.
More silt is deposited in the
ditches. The silt is stirred
up from the bottom in shallow
water by rough weather.
Halligen (Islands)

near Sudeshafen Nordstrand I.

Festuca marsh just outside the dyke

Festuca rubra
Agropyron pungens
Artemisia maritima
Puccinellia maritima
Plantago maritima
Limonium commune
Triglochin maritima

forming a dense low sod.

On sides of ditches
Obione portulacoides
Suaeda
Aster tripolium

This is similar to what was on the land inside the dykes before they were built.

Inside dykes land is 60cm - 1m above mean h t. Roadside ditches have some water. ~~hard~~ Very heavy soil. Potentially a Fraxinetum. Some spontaneous Fraxinus saplings along the ditches. Ulmus, also. Salix spp. Alnus.

Barley, Wheat, beets, rape, hay rich meadows, but with much Ranunculus, increased by grazing.

Cattle and sheep both common.

Dykes covered by a low sod on inside much Carum carvi & Bellis. Two series of dykes,

the inner called "sleeping dykes" maintained in case outer are breached by waves.

Ponds represent places from which dyke material was removed.

On both sides of the dyke on which the road goes to Nordstrand is a belt of reclaimed land, still at about h t. serving as pasture for sheep. Spartina townsendii has been planted here and has spread, proving very ~~[illegible]~~ valuable in speeding up reclamation.

North of this dyke is a large polder, mostly in wet meadow.

Leaving this, going inland, ~~over~~ very flat land to Hatstett; turn north again.

Meadow land with some grain fields. Marshy ditches, with Salix.

Grain fields' proportion increases north. Barley, so this must be reclaimed marsh rather than moraine. Land cut by drainage ditches with considerable water. — This is a "kroog" a polder, dyked off for 400 years.

Struckum.

Fields in the koogs are separated primarily by low earth walls. Hedges on these sometimes.

Bredstedt – road crosses an area of old moraine. Cross highest point in Nord Friesland. 28 m. Descend to Bordelum and Sterdelum, still on the moraine, but with marsh (or polder) just to left. The road now goes along an old, 15th century dyke. Ditched meadows and fields on ~~the~~ both sides. Black-White Holstein-Friesian cattle in abundance. No other kind.

Old houses built on mounds for protection against storm tides. Were formerly on island. Now reclamation and building of large dyke now makes this unnecessary, and new houses are on level ground.

Large ditch inside dyke, from which material was taken. Road very undulating from being built on peat.

Canal turns inland. Carries water from two small rivers.

Bottschlotter See on rt. turn left to main dyke again.

Much of beauty of this flat country is in the thatch-roofed Friesian Islands. (photos) Tudenswart

Newly reclaimed area s. of Fahretoft.

On area exposed by digging for dyke material the old ditch system, pre 1047 exposed, filled by more recent mud. (photos)

On this bare white clay, hardened by sulfates, Salicornia, Spergularia + Festuca rubra are pioneers.

Outside this area is a wide belt of Puccinellia sod, separated from it by a ditch and low dyke. Beyond this is a large area of Spartina townsendii, now mostly ~~dead~~ died down and sprouting. Being drained by lines of tile packed in heather.

Beyond this is an area of dead Salicornia on hard clay, with abundant seedlings. Small patches of Fanaria also of Suaeda and Puccinellia ~~maritima~~ distans, Atriplex. These all a dm. or ~~so~~ two across. A few of Spartina, larger.

Beyond this similar area but with dead Suaeda as well as Salicornia, larger patches of some of same plants.

Suaeda seedlings very abundant. Poa trivialis (saw)

Farther out, just inside the main dyke, is an area lower still, with a scattering of dead Salicornia and a few Salicornia seedlings practically nothing more. And some of this area still under water.

North of Fahretoft large areas of "koog" of Puccinellia sod meadow, with ditches. Grazed by cattle and sheep. A fine close firm sod.

In very wet areas, solid stands of Phragmites.

Inland some barley fields.

Large canal lined with Phragmites. Roadside ditches, also.

Back of Ockholmer Koog.

Ockholm, cultivation and meadow.

Enormous area of flat and ditched land.

Stedebüll. Old moraine begins.

West Bordelum.

Turned north on highway.

View to west over koogs, sea and the Halligen (islands) on the horizon.

Goesharde
Calluna heath with
Arnica (photo)

Calluna v.
Erica tetralix
Arnica
Genista pilosa
Genista anglica
Scorzonera
Potentilla ~~tormentilla~~ erica
Luzula multiflora
Pedicularis
Luzula campestris
Nardus stricta
Deschampsia flexuosa
In wet places
Narthecium
Drosera rotundifolia
Eriophorum
Myrica gale
Salix repens
Scirpus caespitosus
Mollinia
Potentilla erica
Salix cinerea:
Calluna
Carex panicea
Sphagnum
Rhynchospora
Salix aurita
Phragmites
Juncus squarrosus

Turned east
Much flat land, Calluna heath but largely planted to pine.
Picea plantations.
Some pastures and rye fields.
Some oak around edges of pine and spruce plantations.
Goldelund.

Goldelund. buried
Fragment of old series of profiles in a sand dune. from superimposed podsol profile.
Old dune surface a black layer (from an Erica tetralix heath) below this a deep white sand layer, then ~~black~~ humus B, fading to yellow sand with irregular bands of black. These quite thick – only of humus, not of iron. This quite thick
The top black layer of this buried portion is banded with thin layers of sand – possibly wind blown.
The Erica vegetation may have been destroyed by sheep.
Deep in the B horizon is some iron.
Typical profile of Ericetum

above this buried A. a yellow B about 4 dm. thick with very thin brown bands, darkening upward, then about 1 dm. gray sand, then a thin black layer. Then a gray layer, blackish upward. Then another yellowish gray layer perhaps 15-20 cm. then gray for 10-15 cm. to surface.
In second profile are white spots. ~~probably~~ ~~and tubes~~. balls of
always associated with presence of man.

Under a Populo-Quercetum.

~~[illegible]~~
On way back ~~bet Goldelund~~.
A large peat bog being dug and stacked up to dry for burning as fuel.
Sillerup or Seeland Moor?
Another smaller one near Sollerup has been dug up quite a bit and Eriophorum has come up in great abundance.

Generally typical level old moraine landscape. fields, meadows, hedges on low walls. Rye
Lübeck

Albert Heykena

Kiel
Botanisches Institut

Hildegard Rüter
Kiel
Esmarchstr. 18

W. Lötschert
Staatsinstitut für Allgemeine Botanik
Hamburg 36
Jungiusstr. 6-8

1961 Germany

May 27. Goshaide, about 5 km.
n.w. of Bredstedt

41847 Carex panicea
1 occasional in wet sand heath

1 48 Salix repens
common in rather moist sand heath

1 49 Luzula multiflora
occasional in dry sand heath

1 50 Luzula campestris
common in openings in dry sand heath

1 51 Pedicularis
occasional in moist sand heath

May 27 - newly reclaimed land
south of Fahretoft

1 52 Cochlearia officinalis
occasional on slopes of dyke

53 Poa trivialis
very rare on desiccating clay flat.

May 27. Engelsburg, n.e. Husum
in coppice of Quercus robur

1 54 ~~Convallaria~~ Polygonatum multiflorum?
common

2 55 Luzula campestris:
common in opening

May 27 - Silberstedt Forst,
10 km. w. of Schleswig
in open oak-beech forest

1 56 Cornus suecica
luxuriant colony in

1 57 Dryopteris "spinulosa"

fruits pink;
stems prostrate to ascending

flowers deep rose pink.

slightly fleshy; flowers white,
fruits scarcely or not compressed.
prostrate, culms spreading;
plant purplish.

rhizome white, fleshy;
flowers white with green distal parts.

stems erect, in masses;
bracts white, flowers blackish

1961 Germany

May 28 - Schleswig - Hamburg by car.

In Schleswig a Crataegus with bright rose pink fls. is a common street tree. Tilia is also common.

Just south of Schleswig the highway to Rendsburg passes onto the old moraine landscape - very flat, no Corylus in hedges. Rye is principal crop, with meadows and pastures. a mile or two to the east is the hilly front of the young moraine.

In the old moraine landscape here Spiraea sp. is a very important ~~part~~ component of the hedges, often the entire hedge.

North of Rendsburg is a considerable area mostly planted to Picea forests. Some larch and pine. (n. of Heidbunge) South of this some larch and spruce planted in mixed stands.

Some damage to larch by late frosts. Unseasonal frosts are an effective factor in limiting area of beech, acc. Trautmann.

North of Jevenstedt the hedges have a very mixed

composition, much Salix. Rather little forest. South of here, some patches of pine and of oak, but rather limited. Querceto-carpinetum on moist soils.

Then scattered patches of pine, then more forest both pine and oak, near Brammer.

South of this podzols on slightly higher ground, violet soils, locally brownish on slopes, black in depressions. Mostly in rye, some beets, some meadows. Hedges very mixed, much oak and beech in them.

Nortorf - gardens and fruit trees around houses in suburbs.

Neumünster

Bad Bramstedt

The entire trip is through old moraine landscape.

Some forest north of Hamburg - largely oak, of various heights.

Quickborn - Friedrichsgabe.

Meadowland with hedges.

Some grain fields - wheat?

Then mostly cultivation.

Then a heath on top of a small rise.

1961 Germany

May 28. Hamburg - Dusseldorf (caravelle, left side)

Large areas in Hamburg, e. of Elbe, with fairly large lots, small houses, abundant fruit trees, gardens.

W. of Elbe land is intensively cultivated at first in long parallel strips, then in blocks. Most of the houses are clumped in villages.

Then a fair proportion of pine (?) forest (planted) in fairly large to small aggregations of blocks. This somewhat less southward and some areas of natural oak (?) forest and heather. The pine or spruce forest patches are smaller, but fairly numerous, quite irregular in size and distribution, perhaps 10% or less of total area, increasing to 50% even locally (incl. natural forest and heath). Houses still generally in villages rather than scattered on farms. Soil a light gray to gray-brown, sand color.

Visibility becomes zero before the N. German plain is passed.

A few minutes later, still on plain. A large patch of what may be heath judging from color but laid out in rectangular pattern - possibly forest planting, very young in heath.

Then an abrupt change in pattern of cultivation. Patches smaller, of mostly odd but still geometrical shapes. Orientation not regular any longer, but mixed up. Not much forest. Visibility poor again. Occasional glimpses show this pattern continues but becomes a bit more regular.

About half hour from starting several wooded ridges, close together transverse to course. Otherwise landscape mostly cultivated, irregular patches with hedges, some small patches of forest, probably coniferous and doubtless planted (the altitude now such that details are lost.) Visibility poor again; and descent shortly begins. Landscape still mostly cultivated, patches irregular but geometrical or at least angular.

no visibility for a bit, then similar pattern, flat country, a few small bits of forest. Poor visibility again.

Outskirts of Dusseldorf – Many neat housing developments and appartment developments, grassy or grain fields between them.

Floodplain of Rhine each channel is very green. Forest between east and main channels. West of Rhine some city development. Then ~~of~~ country about 1/3 to 1/4 wooded. City north of small river. Forest on hills, flat tops with some cultivation. Much forest, some subdivisions. Forest obviously carefully managed. blocks clear cut, and in various stages of regrowth. Mostly coniferous but some blocks of beech and possibly oaks or Carpinus.

Then open fields and housing developments for some distance as airport is approached, then some more forest. Then landed. 4:14.

May 28 – Dusseldorf – Paris.

Floodplains in meanders of Rhine completely cultivated in a regular rectangular pattern.

Visibility bad for 15 minutes or so. Then ok for a short distance. From a very high altitude the country appeared to be a vast mosaic of roughly circular large areas of forest in a matrix of cultivated land and towns. Spacing fairly regular and usually about or less than diameter of the forests. Then no visibility again.

After about 10 minutes, deeply incised very regular meanders of a river in forested country. Then generally forested country with flat cultivated valley bottoms, about 60% wooded. Changed gradually to almost completely cultivated and grazed country, only very slightly wooded along streams – gallery forest and a few tiny patches. Pattern of cultivation rectangular but orientation varies locally.

After about 5 minutes patches of wood become frequent and a large area in middle distance. 10–20% of landscape wooded, locally much less. Fairly large patches, then a very large patch just left of course.

Then smaller scattered patches, quite variable in size and perhaps covering 10-15% of country.

Descent to Paris started. More large patches of woods, but not more than 20% of landscape mostly much less.

Poor visibility. Then some fairly large patches of forest (but altitude much lower). 20-30% cover locally, mostly much less. Then a large irregular forest (Fontainebleau?) also other fairly large ones, some locally fairly open. Green fields between them, also open villages.

May 30 – From Orly westward over Versailles a very considerable amount of dense forest. That around Versailles cut up by roads in a very formal and geometric pattern.

About an hour west the clouds cleared away. Ireland (?) is immediately to the right. or Brittany? The part is green but singularly sparsely inhabited. No cities or towns are in evidence. The

landscape shows a very pronounced "grain" of parallel beds or strike lines running southwest culminating in a series of parallel rectangular peninsulas pointing southwest. Forests are not at all evident. Small mountains may be seen well inland. A few small beaches are scattered along the coast, but it is mostly lined by low sea cliffs.

Farther west the coast swings somewhat north, and there are a few tiny islands.

The upper surface of the clouds ~~at~~ with the sun about 20° up, can be likened to a symphony in white and powder-blue.

Virginia

Label typed

June 17 - George Mason High School,
just north of Falls Church
41858 Fagopyrum esculentum
beside road in second growth
deciduous woods.

June 18 - Great Falls
Flowering-
Lysimachia ciliata
Lonicera japonica
Cryptotaenia canadensis
Chrysopogon virginianum
Scutellaria ovata
Liparis liliifolia
Galium obtusum
Elymus canadensis?
Circaea quadrisulcata
Anemone virginiana
Trifolium repens
Juncus tenuis
Lepidium virginicum
Dianthus armeria
Apocynum cannabinum
Tephrosia virginiana
Rosa carolina

Penn.

erect, flowers white.

June 24 - Powdermill Reserve
Powdermill Run
Westmoreland Co.
birds: Crow
Kentucky warbler
Cardinal
Goldfinch
titmouse
Mourning dove
Cowbird
Robin
House wren
Yellow billed cuckoo
Black billed cuckoo
Chipping sparrow
Field sparrow
Red eyed vireo
Indigo bunting
Hairy woodpecker
Cedar waxwing
Song sparrow
Northern yellow throat
Chat
towhee
Golden winged warbler
Crested flycatcher
Scarlet tanager

1961

Mixed hardwood on bottom land rich herb layer
Quercus alba
Carya cordiformis?
Acer nigrum
Nyssa sylvatica
Pinus strobus
Platanus occidentalis
Acer rubrum
Quercus rubra
Fagus grandifolia
~~Magno~~ Juglans cin.
Ulmus
Liriodendron tulipifera
Juglans nigra

Carpinus
Ostrya

Old field with thickets
c/a Prunus serotina
a Pyrus angustifolia
c Acer rubrum
c Cornus florida
o Nyssa sylvatica
c Fraxinus americana
r Rhus typhina
o Acer nigrum
c Salix nigra (near stream course)
r Sambucus canadensis
la Cornus femina Tilia Ulmus
Meadow parts of field
a Chrysanthemum leucanthemum
a Trifolium repens
a Phleum
o Apocynum androsaemum
a Holcus lanatus
c Trifolium agrarium?
a Erigeron strigosus

c Asclepias syriaca
c Plantago rugelii
c Panicum
la Melilotus officinalis

June 25 - Cranesville Swamp
Flat peaty area with scrub or dwarf scrub with Aronia, Hypericum, Vaccinium, Gaultheria, Coptis, Rubus hispidus, Solidago sp. Symplocarpus, etc. growing on a mat of Polytrichum and locally Sphagnum. ~~Coptis~~
Scattered, locally abundant emergents of Nemopanthus, Viburnum cassinoides, Populus tremuloides
Occ. hemlock, Pinus strobus, Picea,

Penn.

Labels typed

June 25 - Powdermill Nature Preserve, Powdermill Run Westmoreland Co. Penna.
Mixed deciduous forest on flood plain.

41859 Mitchella repens
abundant

" 60 Luzula
common

June 25 - Cranesville Swamp
West. Va.

" 61 Luzula
occasional in dwarf scrub around periphery of swamp on thin fine sandy soil.

prostrate; flowers white, purplish outside; fruit scarlet.

Kulani - if prison ~~[illegible]~~
v spots beyond Kulani,
might make it. bad spot beyond
boys school - if wet no good.

Hilina OK.

Kapoho Beach lots

Ocean Rd. =
can make it but RA-
does not want
Should do in reverse order to K. Beach lots. Then
via green lakes and
back track to Kapoho.

Up to Overlook above Kipuka

F.R. Fosberg
Field note book #
beginning with #41723

Formular zum Ab-
stempeln an den Unterzeichneten zu senden. Briefporto bitte beifügen.

Fortsetzung von Seite 2

	an	km	ab	Strecken-Nr des Kursbuches		ab	Anschlüsse nach / an
Koblenz Hbf	13.45	63,1	13.53	(249c)		14.00	Niederlahnstein 14.08 (E 14.21 St Goarshausen 14.49)
				(248a)	🚌	14.10	Mayen Ost 15.12
				(263)	D	14.10	Cochem [Mos] 14.48 Trier 15.49 Luxembourg 17.05 Reims 20.56 Paris Est 22.53
				(263)		14.17	Hatzenport 14.56
				(249)		14.45	Boppard 15.03 Bingerbrück 15.40 (D 15.48 Bad Kreuznach 16.01 Bad Münster a St 16.10 Kaiserslautern δ 17.01 Homburg [Saar] 17.34 Saarbrücken 18.04)
				(195)		15.18	Bad Ems 15.46 Limburg [L] 16.34
							δ Anschluß nach Neustadt [Wstr]: an E 17.46
Rüdesheim [Rh]	14.51	30,2	14.52	(250)	E	15.20	Eltville 15.38
Wiesbaden Hbf	15.22	41,4	15.29	(195b)		15.27	Niedernhausen [Ts] 15.55 (16.00 Camberg [Nass] 16.23)
				(195e)		15.28	Bad Schwalbach 16.10
				(317)	E	15.35	Mainz 15.44 (15.53 Rüsselsheim 16.10) Gr Gerau 16.04 Darmstadt 16.17
				(2195/60)	🚌	16.00	Schlangenbad 16.32
				(250b)	E	16.01	Frankfurt-Höchst 16.27 (16.38 Bad Soden [Ts] 16.52 **und** a 17.18, 17.40 Königstein [Ts] 17.52, 18.11)
				(249a)	E	16.05	Worms 16.52 Ludwigshafen [Rh] 17.12 (D 17.24 Mannheim 17.30)
Frankfurt [M] Hbf	16.06	46,2	16.16	(196h)		16.11	a 16.20, 16.41 Bad Homburg 16.36, 16.42, 17.06
				(315a)	D 🚃 ♦	**16.12**	**Mannheim 17.02 Kaiserslautern 18.00 Saarbrücken 18.48 Metz 19.50 (♦ 19.54 Bar-le-Duc 20.48 Paris Est 23.46)**
				(315)	D	16.15	Heidelberg 17.15 Karlsruhe 17.52 Baden-Baden 18.18 Offenburg 18.43 Freiburg [Brsg] 19.24 Basel SBB 20.30
				(196)	D	16.15	Friedberg [Hess] 16.43 B Nauheim 16.51 Gießen 17.23 (17.34 Marburg [L] 18.15) Siegen 18.49
				(315a)	E	16.17	Goddelau-Erfelden 16.55 Biblis 17.13 Lampertheim 17.25
				(196g)		a 16.20	c 16.41 Usingen 17.28 Δ 17.53
				(315)	E ✗	16.21	E 16.48 Weinheim [Bgstr] 17.20, 17.51
				(192a)	✗	16.22	E 16.35 Offenbach [M] 16.34, 16.46 Hanau 16.50, 16.59
				(192)	✗	16.22	† 16.40 Wächtersbach 17.48, 18.12 (a 17.51, 18.18 Bad Orb 18.01, 18.28)
				(196h)		16.26	Kronberg [Ts] 16.54
				(192)		c 16.40	a 16.59 Fulda 19.20 Bebra 20.45
				(196)	**F 43 🚃 ♦ „Roland"**	**17.14**	**Gießen 17.59 Kassel 19.28 Göttingen 20.21 Hannover 21.23**
							Δ Bad Homburg umsteigen
Aschaffenburg Hbf	16.50	51,6	16.52	(416d)		b 17.04	✗ 17.42 Miltenberg 18.11, 18.43
				(416f)		a 17.15	Mömlingen Bf 17.55
				(416)	E	17.23	Lohr Bf 18.00
				(416f)		17.57	Höchst [Odw] 19.04
Gemünden [M]	17.38	37,7	17.40	(192)		17.52	Jossa 18.19 (19.45 Brückenau Bad 20.10 Wildflecken 20.42)
				(416)	E	18.16	Karlstadt [M] 18.27
				(418d)		18.26	Hammelburg 19.12 Bad Kissingen 19.44
Würzburg Hbf	18.08	102,2	18.17	(322)	D	18.18	Lauda 18.55 (E 19.10 Bad Mergentheim 19.20 Crailsheim 20.37) Heilbronn 20.09
				(419)	E	18.24	Schweinfurt 19.00 Bamberg 19.54 Lichtenfels 20.26 (21.10 Coburg 21.36) Neuenmarkt-Wirsberg 21.22 (22.01 Bayreuth 22.32) Hof 22.32
				(415)	E	18.24	Steinach 19.25 (19.41 Rothenbg odT 20.02) Ansbach 19.52 Treuchtlingen 20.38
				(415)	E †	18.24	Eichstätt 21.06 Ingolstadt 21.33
				(416)	✗	18.58,	19.27 Kitzingen 19.25, 19.54
				(416)	E	19.48	Neustadt [Aisch] 20.31 Fürth [Bay] 20.56

Frankfurt/M
Sitz der
Adler-Werke

Fortsetzung Seite 4

parbuch - Deine Reisekasse

S

	an	km	ab	Strecken-Nr des Kursbuches		ab	Anschlüsse nach an
📯 **Nürnberg Hbf**	19.27		19.42	(420)	D	19.46	Dombühl 20.53
				(417)	E	19.50	Neumarkt [Opf] 20.18 Regensburg 21.08 Plattling 22.00 (22.06 Passau 22.49)
Nürnberg Sitz der Triumph-Werke				(414)		19.50	Erlangen 20.30 Forchheim [Opf] 20.52
				(423)	E	19.51	Neukirchen 20.42 Weiden [Opf] 21.51
		137,2		(417c)		19.55	Feucht 20.10
				(413)		19.56	Schwabach 20.21 Pleinfeld 20.57
				(413)	E	20.29	Treuchtlingen 21.20 Donauwörth 21.57
				(423)		21.00	Amberg 22.52 (🚌 c 22.55 🚌 a 23.15 Schwandorf 23.45, 0.10)
				(421)	E	21.55	Schnabelwaid 23.04 Bayreuth 23.23
📯 **Augsburg Hbf**	21.08		21.12	(411a)	🚌 X	21.20	🚌 c 22.20 Aystetten 21.55, 22.55
				(404a)	🚌 †	21.40	🚌 23.10 Landsberg [Lech] 22.41, 0.22
				(411d)	†	21.51	a 22.35 c 23.25 Schrobenhausen 22.42, 23.26, 0.16
		61,9		(410c)		21.50	Gessertshausen 22.14
				(411a)	🚌 a	22.20	🚌 c 23.20 Welden 23.15, 0.15
				(410c)		22.34	Dinkelscherben 23.11
				(405)		23.47	Buchloe 0.40
📯 **München Hbf**	21.53		22.28	(413a)		22.10	Dachau Bf 22.30
				(401b)		22.26	Starnberg 22.56 Tutzing 23.10
				(413)	E †	22.30,	0.10 Wolnzach Bf 23.20, 1.12
				(428)	🚃 D	22.35	Rosenheim 23.18 Kufstein 23.44 Innsbruck 1.24 Bolzano/Bozen 4.43 Merano/Meran 5.42
				(428)	🚃 D	22.35	Verona 6.54 Venezia SL 10.13
				(428)	D	22.35	Verona 6.54 (🚃 7.13 Milano C 9.10) Bologna C 8.46 (9.03 Rimini 10.18 Ancona 11.52) Firenze SMN 10.34 Roma T 14.40
				(428)	D	22.42	Prien 23.45 Traunstn 0.07 Freilassg 0.33 Wels 2.49 Linz 3.12 Wien West 6.20
		153,3		(410a)		22.46	Nannhofen 23.24
				(424a)		22.52	Freising 23.35
				(401a)		22.58	Herrsching 23.48
				(402)	E So	23.00,	23.10 Weilheim [Obb] 23.41, 0.06
				(402)	E So	23.00	Murnau 23.58 Garm-Partenk 0.28 Mittenwald 0.56
				(2429/3)	🚌	23.10	Bad Wiessee 0.16 Tegernsee 0.35
				(406a)		23.12	Fürstenfeldbruck 23.43 Geltendorf 0.11
				(424)	E	23.20	Landshut [Bay] 0.20
				(427)		23.29	Dorfen Bf 0.34 Mühldorf [Obb] 1.03
				(2429/40)	🚌	23.35	Wolfratshausen 0.41 Kochel 1.45
				(429a)		0.05	Holzkirchen 0.55
Salzburg Hbf 🏛	0.12	99	0.50				**Weitere Halte zwischen Salzburg und Badgastein:** Hallein an 1.08 Golling-Abtenau an 1.19 Bischofshofen an 1.42 Schwarzach-St Veit an 1.59
Badgastein	2.48	52	2.52				**Weiterer Halt zwischen Badgastein und Spittal-Millst:** Mallnitz an 3.10
Spittal-Millstätt	3.45	37	3.51			6.20	Lienz 7.42 S Candido/Innichen 9.20
Villach Hbf	4.22		4.50		D 🚗	4.40	Velden a W 4.53 Pörtschach a W 5.00 Krumpendorf 5.06 Klagenfurt 5.12
		103			🚃 Ex	4.57	Tarvisio 5.30 Udine 7.45 Trieste C 9.30
							Weitere Halte zwischen Villach und Ljubljana: Rosenbach 🏛 an 5.16 Jesenice [Aßling] 🏛 an 5.53 Lesce Bled [Veldes] an 6.44 Kranj [Krainburg] an 7.11
Ljubljana [Laibach]	7.48	142	8.30			11.03	Rijeka [Fiume] 14.42
							Weiterer Halt zwischen Ljubljana und Zagreb: Zidani Most 9.34
Zagreb [Agram]	10.57	414	11.12				**Weitere Halte zwischen Zagreb und Beograd:** Banova Jaruga 12.25 Novska 12.43 Slav Brod 13.52 Vinkovci 14.50
Beograd [Belgrad]	17.01	244	18.20		§ 🚃	18.35	Sofija OEZ 5.10 Istanbul OEZ § 22.35
							§ 🚃 ab München **nur** Mo, Mi, Sa
Nis	22.02	960	22.22				**Weiterer Halt zwischen Nis und Athen:** Thessaloniki [Saloniki] an OEZ 9.39
Athen	OEZ 22.09						

„Ihr Zug-Begleiter" erscheint monatlich nach dem neuesten Stand des Fahrplans.
Inhalt ohne Gewähr Herausgegeben in Zusammenarbeit mit der Deutschen Bundesbahn.
Verlag Kultur u. Wissen GmbH., Abt. Fahrplan, Frankfurt/M., Münchener Str. 54, Tel. 331214/331196.
Druck: Phil. L. Fink KG., Groß-Gerau

„Ihr Zug-Begleiter"

Jugoslavia-Express **D 264** 1. 2.	**Den Haag - Emmerich - Köln - Bonn - Wiesbaden - Frankfurt** [M] **- Nürnberg - München - Salzburg - Villach - Beograd** [Belgrad] **- Athen** ✕ Den Haag - München 🚃 1. 2. Bruxelles - Venezia 🚃 2. Aachen - Meran 🚃 1. 2. München - Sofija 🚃 1. 2. München - Istanbul (ab München Mo, Mi, Sa) 🚃 1. 2. München - Trieste 🛏 1. 2. München - Beograd [Belgrad] 🛏 1. 2. München - Athen (ab München Di und Fr) 🛏 1. (Wien -) Beograd - Athen (ab Beograd Mo und Fr)

Bundeshauptstadt Bonn: Bundeshaus — Rheinseite
Photo: Aero-Lux — freigegeben gem. min. Verfg. Nr. 312/56
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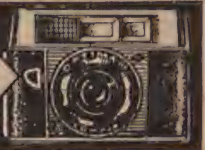
Agfa ...mit der magischen Taste
AGFA OPTIMA
die Vollautomatische ab DM 179.-


Wir wünschen Ihnen eine angenehme Reise!
We wish you a pleasant journey!

„Ihr Zug-Begleiter" unterrichtet Sie auf den nachfolgenden Seiten über die Fahrzeiten und Anschlußmöglichkeiten dieses Zuges.

TRIUMPH
Die „Handschrift" moderner Menschen

Ausgabe: Mai 1961 (gültig bis 27. Mai 1961) **BITTE MITNEHMEN!**

Jugoslavia-Express D 264	Den Haag - Emmerich - Köln - Bonn - Wiesbaden - Frankfurt [M] - Nürnberg - München - Salzburg - Villach - Beograd [Belgrad] - Athen

Erläuterungen: TEE = Trans-Europ-Express (🚆), F = Fernschnellzug, D = Schnellzug, E = Eilzug, 🚆 = Triebwagen, ⚒ = werktags, † = sonn- u. feiertags, So = sonntags, Mo = montags, Di = dienstags, Mi = mittwochs, Do = donnerstags, Fr = freitags, Sa = sonnabends, a = ⚒ außer Sa, b = täglich außer Sa, c = † u. Sa, ● = tägl. außer So, ⧫ = nur 1. Kl., ( ) oder — = umsteigen, 🚃 oder ▬ = Kurs- bzw. Liegewagen, 🛏 = Schlafwagen, 🚌 = Omnibuslinie (Bahn, Post oder Privat), weitere Buchstaben u. Zeichen s. Fußnoten. Die Fahrpreise werden nicht nach den km-Angaben in der Zuglaufspalte, sondern nach besonderen Tarifentfernungen berechnet. Bei den angegebenen Anschlüssen ist in einigen Fällen eine Umwegkarte erforderlich.

📯 = Postsparkassendienst Tag und Nacht in Bahnhofsnähe.

	an	km	ab	Strecken-Nr des Kursbuches		ab	Anschlüsse nach an
Den Haag SS		148	8.32				**Weitere Halte zwischen Den Haag und Emmerich:** Utrecht CS an 9.15 / ab 9.20 Arnhem 🏛 an 9.58 / ab 10.14
Emmerich 🏛	10.37	60,8	10.39	(235)	🚌	⚒ 11.10,	12.06 Empel-Rees 11.30, 12.21 (🚌 12.25 Bocholt 13.15) Wesel 12.10, 12.48
📯 Oberhausen Hbf	11.21	7,6	11.31	(227)	E	11.26	Essen 11.43 Bochum 11.56 Witten 12.13 Hagen 12.32 (D 12.57 Kassel 16.16)
				(227)	E	11.26	Bochum 11.56 (E 12.01 Dortmund 12.20 — E 12.31 Hamm [W] 12.51 Soest 13.18 Paderborn 14.10)
				(227)	E	11.26	Hagen 12.32 (🚃 D 12.57 Arnsberg [W] 13.51 Bestwig 14.21 Brilon Wald 14.44 B Wildungen 16.42)
				(236)	E	11.28	Bottrop 11.41 Dorsten 12.01 Coesfeld [W] 12.32 Rheine 13.14
				(235b)		11.30	Spellen [Nrh] 12.10
				(236a)		11.39	Gelsenkirchen Zoo 12.17
				(235b)		11.55	Duisburg-Ruhrort 12.10
				(227)	D	11.57	E-Altenessen 12.07 Gelsenkirchen 12.17 Wanne-Eickel 12.26 Herne 12.33 Dortmund 12.53 Hamm [W] 13.23 (13.54 Münster [W] 14.39 **und** D 15.03 Osnabrück 16.09 Bremen 17.38 Hamburg 19.07) Bielefeld 14.15 Herford 14.30 Minden [W] 14.57 Hannover 15.42 Braunschweig 16.54
				(243a)		12.02	Moers 12.31
				(236)		12.14	Recklinghausen 13.01
📯 Duisburg Hbf	11.39	23,7	11.41	(244)	E	11.46	Krefeld 12.02 (12.45 Kleve 14.13) Viersen 12.16 M Gladbach 12.25 Lindern 12.54 Aachen 13.36
				(232a)		12.00	Duisburg-Wedau 12.08
				(227)		⚒ 12.15	12.56 Kalkum 12.28, 13.08
📯 Düsseldorf Hbf	11.58	40,0	12.01	(229)		12.12	Sol-Ohligs 12.36 Remscheid 13.09
				(2245/21)	🚌	12.15	Elmpt Markt 13.58 Roermond Hbf 15.02
				(227)		12.17	Leverkusen-Wiesdorf 12.41
				(228)	E	12.38	Wuppertal-Elberfeld 13.14
				(2246/3)	🚌	⚒ 12.45	Viersen, Augustaplatz 14.00
📯 Köln Hbf	12.28	33,3	12.44	(250)	E	12.36	Troisdorf 12.55 Königswinter 13.13 Linz [Rh] 13.30 Neuwied 13.51 N'lahnstein 14.19
				(240b)		⚒ 12.44	Bergisch Gladbach Stadtmitte 13.08
				(240)		12.46	Overath 13.31 Gummersbach ⚒ 14.20
				(249)		12.47	Brühl 13.06
				(247)	D	12.50	Düren 13.14 Aachen 13.39 Liège [Lüttich] G 14.36 Bruxelles M 15.47 (D 16.00 Oostende 17.15)
				(228)	E	⚒ 12.51	E 13.15 Opladen 13.10, 13.34
				(251)	E	12.55	Au [Sieg] 14.05 Betzdorf [Sieg] 14.27 Siegen 14.48
				(248)		Sa 13.01	E 13.50 Euskirchen 13.58, 14.29
				(248)	E	Sa 13.40	E 13.50 Jünkerath 15.25, 15.33 Gerolstein 15.42, 15.51
📯 Bonn	13.06	59,3	13.08	(249)		13.25	Bad Godesberg 13.32 Remagen 13.48 (13.56 Bad Neuenahr 14.12) Andernach 14.16
				(247e)		⚒ 13.34	Rheinbach 14.06 Euskirchen 14.22

Fortsetzung Seite 3

Fortsetzung von Seite 2

	an	km	ab	Strecken-Nr des Kursbuches		ab	Anschlüsse nach an
📯 Koblenz Hbf	13.45	63,1	13.53	(249c)		14.00	Niederlahnstein 14.08 (E 14.21 St Goarshausen 14.49)
				(248q)	🚌	14.10	Mayen Ost 15.12
				(263)	D	14.10	Cochem [Mos] 14.48 Trier 15.49 Luxembourg 17.05 Reims 20.56 Paris Est 22.53
				(263)		14.17	Hatzenport 14.56
				(249)		14.45	Boppard 15.03 Bingerbrück 15.40 (D 15.48 Bad Kreuznach 16.01 Bad Münster a St 16.10 Kaiserslautern ♁ 17.01 Homburg [Saar] 17.34 Saarbrücken 18.04)
				(195)		15.18	Bad Ems 15.46 Limburg [L] 16.34
							♁ Anschluß nach Neustadt [Wstr]: an E 17.46
Rüdesheim [Rh]	14.51	30,2	14.52	(250)	E	15.20	Eltville 15.38
📯 Wiesbaden Hbf	15.22	41,4	15.29	(195b)		15.27	Niedernhausen [Ts] 15.55 (16.00 Camberg [Nass] 16.23)
				(195e)		15.28	Bad Schwalbach 16.10
				(317)	E	15.35	Mainz 15.44 (15.53 Rüsselsheim 16.10) Gr Gerau 16.04 Darmstadt 16.17
				(2195/60)	🚌	16.00	Schlangenbad 16.32
				(250b)	E	16.01	Frankfurt-Höchst 16.27 (16.38 Bad Soden [Ts] 16.52 **und** a 17.18, 17.40 Königstein [Ts] 17.52, 18.11)
				(249a)	E	16.05	Worms 16.52 Ludwigshafen [Rh] 17.12 (D 17.24 Mannheim 17.30)
📯 Frankfurt[M]Hbf	16.06	46,2	16.16	(196h)		16.11	a 16.20, 16.41 Bad Homburg 16.36, 16.42, 17.06
				(315a)	**D 🚆 ⧫**	**16.12**	**Mannheim 17.02 Kaiserslautern 18.00 Saarbrücken 18.48 Metz 19.50 (⧫ 19.54 Bar-le-Duc 20.48 Paris Est 23.46)**
				(315)	D	16.15	Heidelberg 17.15 Karlsruhe 17.52 Baden-Baden 18.18 Offenburg 18.43 Freiburg [Brsg] 19.24 Basel SBB 20.30
				(196)	D	16.15	Friedberg [Hess] 16.43 B Nauheim 16.51 Gießen 17.23 (17.34 Marburg [L] 18.15) Siegen 18.49
				(315a)	E	16.17	Goddelau-Erfelden 16.55 Biblis 17.13 Lampertheim 17.25
				(196g)		a 16.20	c 16.41 Usingen 17.28 Δ 17.53
				(315)	E	⚒ 16.21	E 16.48 Weinheim [Bgstr] 17.20, 17.51
				(192a)		⚒ 16.22	E 16.35 Offenbach [M] 16.34, 16.46 Hanau 16.50, 16.59
				(192)		⚒ 16.22	† 16.40 Wächtersbach 17.48, 18.12 (a 17.51, 18.18 Bad Orb 18.01, 18.28)
				(196h)		16.26	Kronberg [Ts] 16.54
				(192)		c 16.40	a 16.59 Fulda 19.20 Bebra 20.45
				(196)	**F 43 🚆 ⧫ „Roland"**	**17.14**	**Gießen 17.59 Kassel 19.28 Göttingen 20.21 Hannover 21.23**
							Δ Bad Homburg umsteigen
📯 AschaffenburgHbf	16.50	51,6	16.52	(416d)		b 17.04	⚒ 17.42 Miltenberg 18.11, 18.43
				(416f)		a 17.15	Mömlingen Bf 17.55
				(416)	E	17.23	Lohr Bf 18.00
				(416f)		17.57	Höchst [Odw] 19.04
Gemünden [M]	17.38	37,7	17.40	(192)		17.52	Jossa 18.19 (19.45 Brückenau Bad 20.10 Wildflecken 20.42)
				(416)	E	18.16	Karlstadt [M] 18.27
				(418d)		18.26	Hammelburg 19.12 Bad Kissingen 19.44
📯 Würzburg Hbf	18.08	102,2	18.17	(322)	D	18.18	Lauda 18.55 (E 19.10 Bad Mergentheim 19.20 Crailsheim 20.37) Heilbronn 20.09
				(419)	E	18.24	Schweinfurt 19.00 Bamberg 19.54 Lichtenfels 20.26 (21.10 Coburg 21.36) Neuenmarkt-Wirsberg 21.22 (22.01 Bayreuth 22.32) Hof 22.32
				(415)	E	18.24	Steinach 19.25 (19.41 Rothenbg odT 20.02) Ansbach 19.52 Treuchtlingen 20.38
				(415)	E †	18.24	Eichstätt 21.06 Ingolstadt 21.33
				(416)		⚒ 18.58,	19.27 Kitzingen 19.25, 19.54
				(416)	E	19.48	Neustadt [Aisch] 20.31 Fürth [Bay] 20.56

Frankfurt/M
Sitz der
Adler-Werke

Fortsetzung Seite 4

POST
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Dein Postsparbuch - Deine Reisekasse

FLORISTISCH-SOZIOLOGISCHE ARBEITSGEMEINSCHAFT

(23) Stolzenau/Weser, 9. Mai 1961
Schinnaer Landstr. 6
Fernruf 353

2. Rundschreiben

an die Teilnehmer der Pflanzensoziologen-Tagung in Schleswig.

Zu der vom 25. - 27. Mai 1961 in Schleswig stattfindenden

Pflanzensoziologen-Tagung

mit den anschließenden Exkursionen durch die verschiedenen Diluvial- und Alluvial-Landschaften Schleswigs haben sich über 100 Teilnehmer aus dem In- und Auslande gemeldet.

Die Tagung beginnt am Donnerstag d. 25. Mai 1961 um 9 Uhr c.t. in der Aula der städtischen Mittelschule (Bruno-Lorenzen-Schule) an der Allee (am Chemnitz-Bellmann-Denkmal; Parkplatz vor der Jugendherberge).

Vortragsfolge:

Dr. e.h. Willi Christiansen, Kiel: Die pflanzengeographische Sonderstellung Helgolands.

Dr. Helmut Freitag, Potsdam: Flora und Vegetation des Stechlin-Sees.

Dr. Uwe Jensen, Kiel: Ökologische Eichstufen in natürlicher oligotropher Moorvegetation und ihre Zusammenfassung zu ökologischen Stufenkomplexen. Die Ursachen der Artenarmut der ombrotrophen Moorvegetation.

Dr. Heinz-Dieter Krausch, Potsdam: Vorschläge für die Gliederung der mitteleuropäischen Sand-Trockenrasen.

cand. Friedrich-Wilhelm Röpke, Kiel: Die Buchenwaldgesellschaften Schleswigs.

Kreisbeauftragter für Naturschutz und Landschaftspflege und Bauer Hans Möller, Schwensby: Einführung in die schleswigsche Landschaft anhand farbiger Lichtbilder.

Exkursionen:

25. Mai 15 Uhr Wanderung durch den Tiergarten zum Studium verschiedener Waldgesellschaften. Treffpunkt: vor Schloß Sottorp.

20^{30} Uhr (Mittelschule) Vortrag Prof.Dr. Ernst-Wilhelm Raabe, Kiel: Eine Einführung in die Vegetationsgrundlagen Schleswig-Holsteins.

26. Mai 8 Uhr. Treffpunkt: Schleihallenparkplatz.

Exkursion an die schleswigsche Westküste: Silberstedt, Kratt Engelsburg, Husum, Schobüll Strand, Nordstrand.

13 - 14 Uhr Mittagspause Norderhafen. Weiterfahrt durch die Köge nach Fahretoft, Fahretoft Koog, Bordelumer Heide, Jordelund. Rückkehr nach Schleswig gegen 19^{30} Uhr.

Beisammensein der Teilnehmer im Wintergarten der Schleihalle (zwanglose Diskussionen).

27. Mai 8 Uhr ab Schleswig, Schleihallenparkplatz.

Fahrt durch die Jungmoränen-Landschaft von Schwansen und Angeln: Bültsee, Missunde, Schwonsburg, Horstkoppel, Westerholz.

13,30 - 14,20 Uhr Mittagspause.

Langballigau, Glücksburg.

Rückkehr nach Schleswig gegen 19 Uhr.

Meldung und Beitrag:

Die große Teilnehmerzahl macht die Einzahlung der Exkursionskosten (Autobus) in Höhe von 18,50 𝔐 bis zum 18. Mai 1961 auf das Postscheck-Konto Hannover Nr. 136555 der Floristisch-soziologischen Arbeitsgemeinschaft unbedingt notwendig.
Benutzung von Privatwagen ist leider ausgeschlossen.

Teilnehmer der Tagung, die nur die Vorträge, aber nicht die Autobus-Exkursionen mitmachen, zahlen nur 1,-- 𝔐 Tagungsbeitrag. Die Teilnahme nur an der Autobus-Exkursion am 26. Mai kostet 9,-- 𝔐, nur am 27. Mai 8,-- 𝔐.

Mit der Beitragszahlung bitten wir zugleich angeben zu wollen, wer an dem gemeinsamen einfachen Mittagessen am 25. und am 26. Mai teilnehmen will. Die Kosten dafür sind nicht in den oben genannten Exkursionskosten enthalten.

Ein Quartier-Nachweis, vermittelt durch das Städtische Verkehrsbüro, Schleswig, Stadtweg 26, ist beigefügt (sofern Unterkunft bestellt worden ist).

Evtl. Abbestellungen von Quartieren können ohne Kosten für den Gast nur dann berücksichtigt werden, wenn sie unmittelbar an das Städtische Verkehrsbüro Schleswig gerichtet werden und dort spätestens bis zum 19. Mai eintreffen. Eine Mitteilung an unsere Arbeitsgemeinschaft, daß die Teilnahme an der Tagung nicht erfolgen kann, gilt nicht als Quartier-Abbestellung.

Den Teilnehmern, die mit dem Zuge fahren, wird empfohlen, sich sehr zeitig am Heimatbahnhof ein Formular für Fahrpreisermäßigung (331/3 %) für Lehrgangsbesucher abzuholen und das ausgefüllte Formular zum Abstempeln an den Unterzeichneten zu senden. Briefporto bitte beifügen.

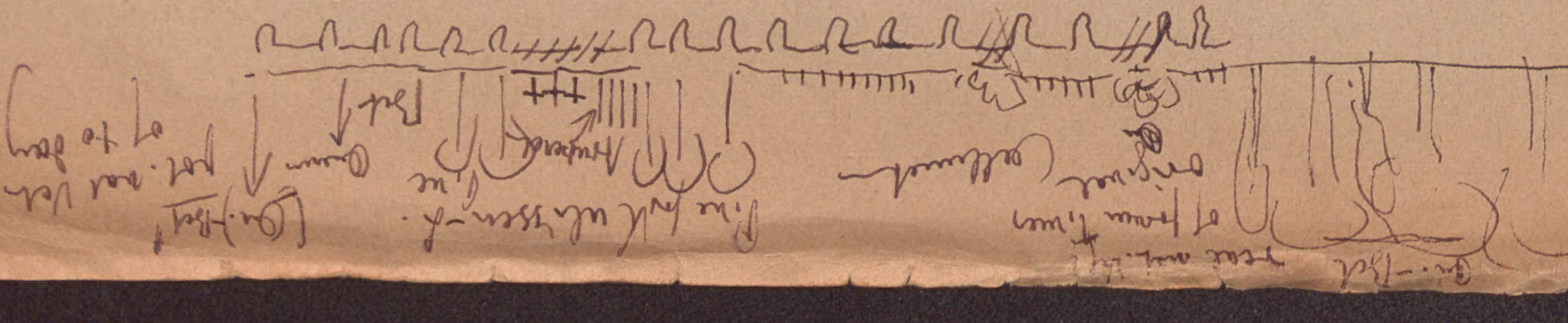
Mit freundlichen Grüßen und Auf Wiedersehen in Schleswig

(Tüxen)

1961
W
1930
D
D

Anlagen:

1 Quartierschein
1 Zahlkarte



Kalani - if prism workers
v spots beyond Kalani,
might make it. 1 bad spot beyond
boys school - if wet no good.

Hilina OK.

Kapoho Beach lots

Ocean Rd. =
can make it but Rt-
does not want
should do in reverse order to K. Beach lots then
via green lakes and
back track to Kapoho.

Up to Overlook above Kipuka

F. R. Fosberg
Field note book #
beginning with #41723